FACULTY OF BUSINESS ADMINISTRATION AND ECONOMICS SCIENCE

THE IMPACT OF CAPITAL MOBILITY ON THE GREAT DEPRESSION & GREAT RECESSION: A THEORETICAL AND EMPIRICAL POINT OF VIEW.

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May 25th, 2021

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ABSTRACT

In this paper we have shown that the relationship between Savings and Investment has varied across time, thus implying changes on capital mobility in different periods. Moreover, we have shown that the International Monetary and Financial System (IMFS) of different periods have different impacts on capital mobility and financial crises, depending on the nature of it. Using the idea of the Global Saving Glut by Bernanke (2005) and the Basco's (2014) OLG model that includes bubble, we have shown that international capital mobility has played a significant role in the formation of the bubble in the Great Recession (1920's) and the Great Recessions (2008).

Finally, we have also shown that the crises of both *Grand Financial Crises* were quite similar, or, at least in the causes of it. Foreign capital exploited the financial weaknesses and help to extend the crises across borders and in some cases the glut of capital created financial bubbles. In both cases an excess of capital and an exhaustion of "good investments", as I defined for those investments that expands the production capability of an economy, help to create speculative behaviors in the market that ended with asset bubbles.

INTRODUCTION

The Truth is written by the victors, this saying is very well known in popular culture and at the end it reflects the mistrust of the general population on the written history. The same can be said with financial crises, especially when it is painful and long. Usually the people in the top, the establishment, defends the current system by saying that the cause of the crisis was due to some greedy investors, some bad apples in the nest that profit from the weakness of the system. However, what if the whole fruit shop is rooted, not just a "couple of it".? So, the financial crisis is in the DNA of the current system.

This paper will use circumstantial evidence and if possible, use direct evidence to indict Capital Mobility as one, if not, the cause of the formation of financial bubbles and the subsequential painful aftermath of the burst of it.

The first part of this work will use Feldstein and Horioka puzzle to test the history of the capital mobility and we will try to create a link between the mobility degree and the International Monetary and Financial System. So basically, compare the capital mobility with the Gold System periods, the Bretton Wood and the current IMFS. At the end, this part will infer the role of the IMFS in capital mobility and the frequencies of the crises (The question that we should answer in the end is if IMFS has a direct role on the frequencies of the crisis through capital mobility).

The second part we will formalize the Global Saving Glut hypothesis and explain the financial crisis of 1929 and 2007/8. We will use an OLG model with the possibility of bubble formation to try to explain theoretically how capital mobility (in one direction) might have contributed to the formation of the crisis. Finally, we will use empirical data to show that capital mobility has or has not played a role.

This paper takes inspiration from the *due process* of the judiciary system, you are innocent until proven the contrary. This paper will show that excess capital can and will create financial crises and if this excess capital goes unidirectionally to a or some countries then it will generate financial bubbles (and crisis).

CAPITAL MOBILITY THROUGHOUT HISTORY: A FELDSTEIN AND HORIOKA PUZZLE APPROACH

The national accounts state that in a closed economy savings (S) is fully transferred to investment (I). Thus, this model implies a causal relationship between savings and investment, if the first one increases then the latter must also increase. In contrast, in an open economy, the relationship is not necessarily a causal relationship, which means that if saving rates increase then the investment might not increase at the same rate. By the same token, if savings rates decrease then foreign sector might compensate for it.

The difference between closed and open economy can be shown easily in the classical macroeconomic saving-investment identity.

In a closed economy, the basic national identity is as follows.

$$GNP = Y = C + I + G$$

Notice that *C* denotes for consumption, *I* denote for Investment and *G* for public spending.

If we add T that denotes government taxes and isolate I then we will have the following equation.

$$(Y - C - T) + (T - G) = I$$

$$S = I$$

The first part $(Y - C - T)$ denotes for private savings and the second part $(T - G)$ denotes for public savings, the sum of both savings (*S*) must be equal to the investment. This means that if savings increases then investment must increase at the same rate, which is a casual relationship.

In an open economy in contrast, we must add the foreign sector.

$$GNP = Y = C + I + G - NX$$

NX represents the difference between exports and imports, the foreign sector.

If we do the same step as in the closed economy model, we will have the following.

$$(Y - C - T) + (T - G) = I - NX$$

$$S = I - NX$$

In the open economy model, the increase in savings might not translate to an increase of investment. The foreign sector plays a role. There is no causal relationship in this case, and it implies that savings move across countries (Capital Mobility).

In the case of an open economy, the intensity of capital mobility has not remained constant. The movement of capital has swung between periods of openness and periods of constraint. The conventional wisdom suggests that before WWI the international market was somewhat integrated under the Gold Standard System centered in London then after the Great Depression there was a period of disintegration and "a process of autarky" and not until the 70's the mobility recover.

The problem is that there is no consensus on how to measure capital mobility. There is a need to test and check the veracity of the conventional idea.

There are two leading criteria or approaches; the first one is based on *price*, which consist of comparing the expected yield of certain assets across countries. The second one is based on *quantity*, which consists of comparing the savings and investment relationship across countries. This paper will use the latter because price criteria need intensive data requirement, it is necessary to use *identical assets* at different markets, and in practice, there might not be the data for all the periods and/or markets. The second criteria do bear a certain economic theory (Taylor, 1996) and substantial studies use the quantity method. One of these studies is the Feldstein and Horioka puzzle, the FH test consists of assessing whether an increase in savings might be retained at the home country or go at the international level, the premise of the work is that the correlation between savings and investment might be a thermometer to measure the degree of capital mobility. The original study used data from the 1960s to the 70s and it found that the relationship between investment and savings in developed countries were quite high, closed to unity (no capital mobility) however the original study was just a snapshot of the '60s and '70s and might not tell the full historical picture, moreover, the results from the original study might not correspond to the current situation or the situation of the early '20s. This paper will extend the model from 1870 to 2016 to observe significant changes in capital movement across different periods, not just a single period like the Feldstein and Horioka work. The extension of the model is inspired by the work of Alan M. Taylor[1] but the data[2] that this paper uses is different.

[1] Taylor, Alan M., International Capital Mobility in History: The Saving-Investment Relationship (September 1996). NBER Working Paper No. w5743.

[2] The paper of Alan M. Taylor uses 12 countries and ranges from 1850 to 1992. This paper will use 16 OECD countries and ranges from 1870 to 2016; the data source of this study is from http://www.macrohistory.net/data/

The model is a classical Ordinary Least Square (OLS) with a cross sectional analysis, although the data looks like a panel data[3]. This paper will analyze using cross-sectional analysis. The different sets of countries are grouped at different periods, so for a certain period, this paper will do a regression line for the set period and observe the results.

There are 2 analyses; the first one is an average of 5 years periods, to observe the long-term evolution of the beta and then a yearly base model that corresponds to the short-term fluctuation that can be useful to observe the effect of policies exogenous shocks or changes on the international environment.

Long Term Model (5 years average)[4] $$\overline{(I/Y)_\iota} = a^{FH} + b^{FH}\ \overline{(S/Y)_\iota} + u_i$$

Short Term Model (Yearly basis) [5] $$(I/Y)_i = a^{Sn} + b^{Sn}(S/Y)_i\ \ + u_i$$

Despite the widespread use of the FH model, it has 2 problems as noted by Obstfeld (1994), the first handicap: Do the regression measure true and unbiased saving-investment retention? There might be a problem of omitted variables and several studies have shown that different factors can alter the attractiveness of a country to be invested or change the pattern of savings. As a result, the simple cross sectional FH test might end up with a *spurious* relationship and biased estimation. Furthermore, in the long run permanent investment must be equal to permanent savings plus a constant, in this context, if we average the periods long enough then we might estimate the intertemporal identity. Sinn (1992) proposed a cross-sectional analysis yearly to avoid the problem.

The second handicap: Even if the results are unbiased, what do the betas mean? How can we tell if capital mobility is high, what is the "golden rule" to consider high or low capital mobility? There is no prior basis to tell how big is big and how small is small, but one possible solution is to interpret the variation of beta across time, let's say that if the beta in a τ period is 1 (which means savings are equal to investment and therefore low capital mobility), and the following period is 0.5 then we can tell that the $\tau + 1$ period has more flexible capital mobility

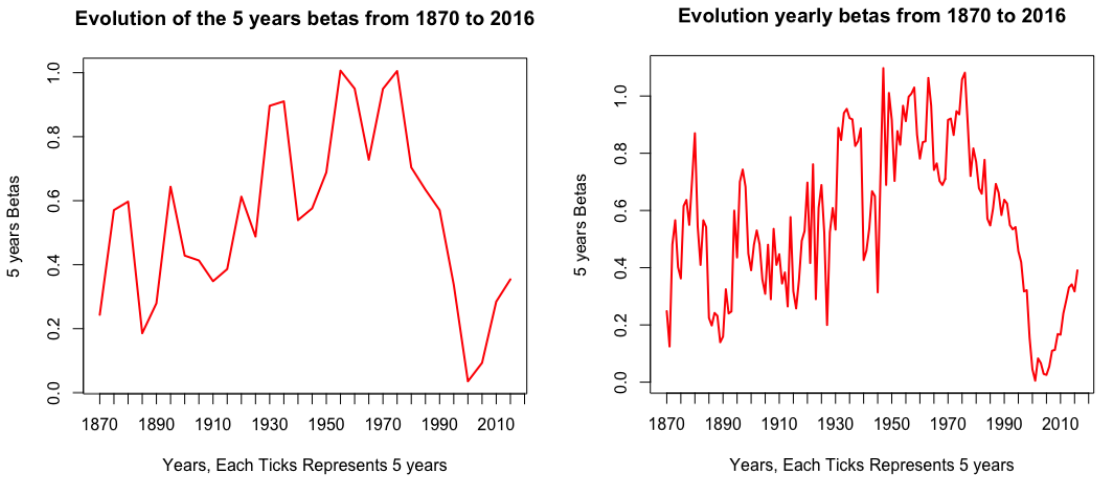
[3] There are 16 identities and 146-time observation (1870-2016)

[4] The Long-Term Model is based on Taylor (1996)

[5] The Short-Term Model is based on Sinn (1992)

policies and therefore capital moves across borders easily, moreover if we observe that $\tau + 2$ has an even lower beta we can conclude that there is a change in periods (From low mobility to High mobility). Thus, this paper will take the conservative approach and the only indicator to tell if capital mobility is high or low is with a meaningful variation of beta across time. The falling beta will mean high capital mobility and increasing beta will mean low capital mobility (or more difficult to move capital across borders).

Model 1: The results of the FH tests in the long run and the short run



The results of the FH test in the long run and the short run, Font: Taylor (1996), Sinn (1992) and Jordà et al. (2016), Source: Own Made

On the left-hand side (L), there is the long term (5 years averages) and on the right-hand side (R), there is the yearly base model, the short term.

The story might be told as follow, according to the results of the (L), in the 1880s capital mobility remain high (falling b^{FH}) because the international powers were in a frenzy for foreign investment, especially the British Empire. Then in the 1890's there is a restriction on capital movement, partially caused by the 1890's crashes (Increasing b^{FH}), by the turn of the 20th century, the international capital movement seems to recover (falling b^{FH}) in a last foreign investment boom by the European empires, then the WWI came and ended the period of financial mobility (Increasing b^{FH})but during the roaring 20's there was a brief window of capital liberty (falling b^{FH}) but quickly change the slope in 1929 with the Great Depression (increasing b^{FH}). Afterward, in the '30s onwards there was more restrictive capital movement. By the '40s and with the second World War, it seems that the capital mobility is increasing

(falling b^{FH}), however, if we look at the data set, we observed that several countries lack data[6] The only reliable source of data came from the UK and the US and during that period there was a significant transfer of capital from the US to the UK due to the policies of the FDR[7] administration, mainly due to the Lend-Lease . In contrast to the interwar period, the 50's to the '70s, capital mobility was relatively low (increasing b^{FH})In the '60s there was a brief easing of capital restriction, but it was short-lived. From the '70s to the 2010's, capital mobility increases (falling b^{FH}) due to the neoliberal policies of free trade and small government, this period lasted about 2008/9 with the Great Recession and capital mobility seems to be more restrictive (increasing b^{FH})but still not as the same level as in the '50s or '70s.

The result might be helpful to discover the role of the international capital movement in the Great Depression and the Great Recession. If the role of the international capital movement is *significant*, we might see that before the crisis we might observe falling b and after the crisis, we might see increasing beta, the intuition is during economic booms with open economies foreign capital surges will expand the credit cycle (economic growth and even asset bubbles), when the economy collapses global capital market stops or dry up and thus capital movement is reduced.

Moreover, during economic turmoil, countries that tend to have current account (*CA*) deficit usually get a sharp reversal from deficit to surplus (or at least reduce the deficit, which is the case of the United States), hence the balance of payment identity implies that if *CA* decreases, it will have an impact either on the capital account (*KA*)[8] or the financial account (*FA*)[9], with the same token, the contrary will happen in economic booms.

Saving-Investment Identity $S - I = NX = CA$

[6] Important world players miss, especially in the continental Europe like France, Germany or Italy

[7] Franklin D. Roosevelt policy: The Arsenal of the democracy, consited that the United States should provide supplies to the countries fighting Nazi Germnay, manily it refers to UK. It was a policy that was implemented before the U.S entrance into the war.

[8] The Current Account (CA) refers to investment in the economic sector like portfolio investment, foreign direct investment.

[9] The Financial account (KA) is the difference between domestic ownership of foreign assets and foreign ownership of domestic assets.

Example: Country A has a Current Account deficit relative to GDP of -5%, this means according to the identity that the country has a gap between domestic savings and domestic investment of 5%, this means that investment is 5 percentage point higher than savings, so the only source of capital should come from abroad.

Balance of Payment Identity $KA + FA = -(CA)$

Example: country A has a *CA* of -100 and *FA*+*KA*=100, then a sudden exogenous crisis happens and the demand of foreign goods decreases. *CA*= -60, the (*K A + F* ≠60). *ô*

The results in both cases are the same, a decrease of *KA*+*FA* that implies less capital moving across countries. As shown in the examples *KA*+*FA* >*(KA*+ *F A)* *ô* .

In the Sinn work (R) is easier to observe because we use the b annually, in the Great Depression we can observe that prior to the crisis the b^{Sn} of 1925 to 1928 was relatively low but in 1930 was increasing, the same happens with the Great Recession before 2008 was relatively low and after 2009, $b^{Sn}$was increasing. We can also observe the minor crisis, for instance, the dotcom bubble and the 2001 recession, we can see that prior 2001 there was falling but during 2003/4 there is a small increase, which is expected because the recession was short and the real economic impact was limited, we can also see the same pattern with the Panic of 1893.

Model 1: Panic of 1893, The Great Depression 1929, The Dotcom 2001 & The Great Recession 2008

Panic of 1893, The Great Depression 1929, The Dotcom 2001 & The Great Recession 2008, Font: Taylor (1996), Sinn (1992) and Jordà et al. (2016), Source: Own Made

As expected, during economic booms, capital mobility increases but during recession time capital flows suffer a sudden stop, either cause by the capital account (decrease) or the financial account ($\Delta\text{Assets} - \Delta\text{Liabilities}) < 0$.

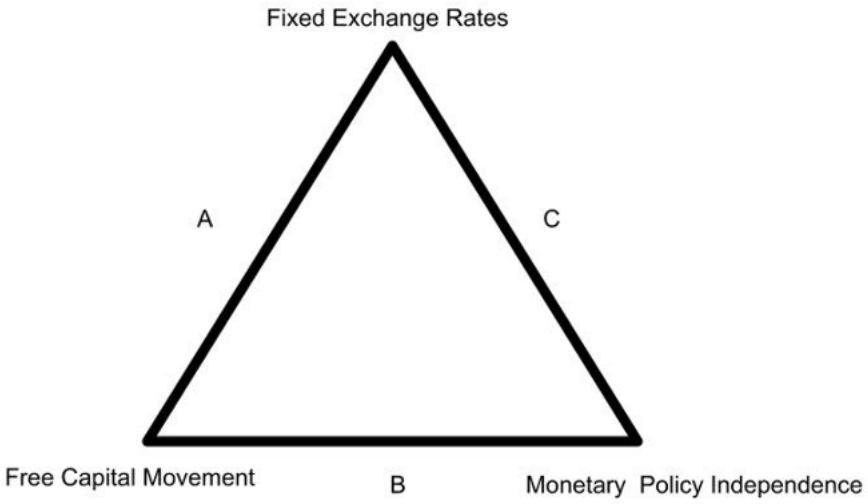
CAPITAL MOBILITY AND THE INTERNATIONAL AND FINANCIAL SYSTEM

The International Monetary and Financial System (IMFS) consists of a set of rules and system/institutional framework in which most of the world economies work from the international flow standpoint. In plain English, what are the channels and conditions that capital and goods move?

To understand the IMFS functioning, it is important to know the concept of the Impossible Trinity or the Trilemma Theory (a basic constraint in the design of any IMFS); this hypothesis states that there are 3 desirables conditions, fixed exchange rate, independent monetary policy, and free movement of capital, yet these three conditions cannot exist at the same time, only two is possible. By inference, we can state that there are 3 different types of IMFS based on the hypothesis; the first one (A) is fixed exchange rate and free movement of

capital (dependent monetary policy), the second (C) is fixed exchange rate and independent monetary policy (no free movement of capital) and the last one (B) is independent monetary policy and free movement of capital (floating exchange rate).

Figure 1: The Impossible Trinity Figure



The Impossible Trinity Figure; source: Own Made

The A-type would be the Gold Systems, both centered in London[10] and New York[11] . The C type would be the Bretton Woods System, although that is also a Gold Exchange System, only the USD was convertible to gold, and each other currencies were pegged to the US dollar- from now on this paper will call it Dollar System. The B type would be free movement of capital and independent monetary policy (with a floating system). This will be the current system that most countries in the OECD works (except the countries in the Eurozone).

The IMFS is important for our paper because as the economist of the Bank of International Settlement, Claudio Borio pointed out "*The Achilles heel of the present-day international monetary and financial system (IMFS) is that it amplifies a key weakness of domestic monetary and financial regimes ï t h e i r ñ e x i c a l s s e l f a i s m a i n c i t y ò . f i n a n c i a l e l a s t i c i t y ò I m e u p o f f i n a n c i a l e i m b a l a n c e s , i n a b i l i t y*

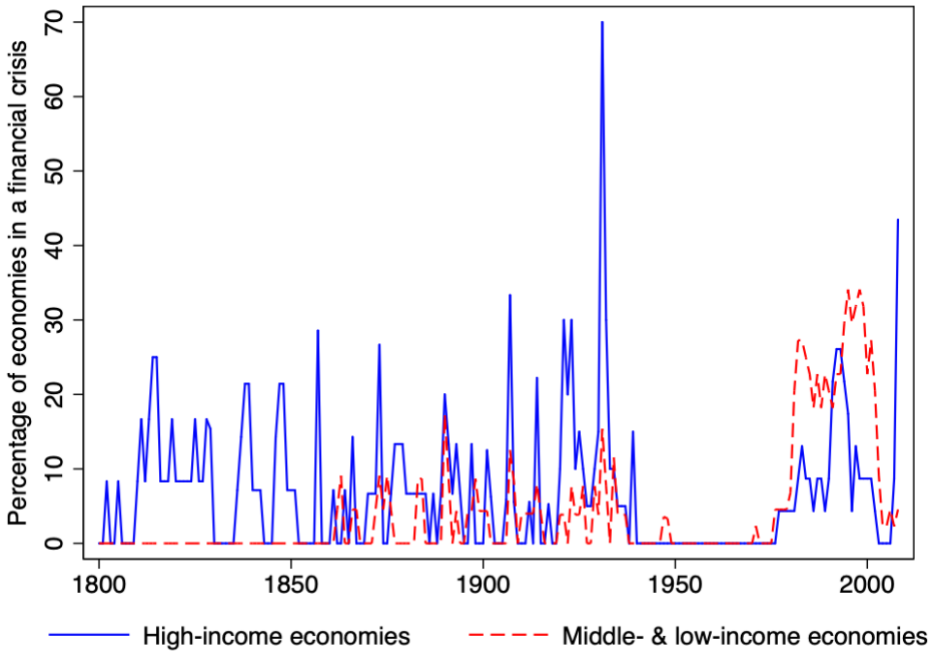
[10] The London System is commonly known as the Gold Standard System (1870's to 1914) each currency was convertible to gold and each citizen could convert its bills into gold.

[11] The New York System is a Gold Exchange System (1925- 1931), in contrast to the Gold Standard, only central banks and big firms were able to change paper into gold.

the form of unsustainable credit and asset price booms that overstretch balance sheets, thereby leading to serious (systemic) banking crises and macroeconomic dislocations (Borio & Disyatat, 2011). Therefore, there are systems that could exuberate the weakness of the domestic market in the form of assets bubbles. This paper will try to link the concept of "excess financial elasticity" of Borio, the Global Saving Glut of Bernanke with the Great Depression and the Great Recession.

Starting with the Borio's idea about the role of the IMFS and the inability to prevent build ups of asset and credits booms that leads to serious financial crises[12]. The following graph from Qian et al (2010), we can observe the frequencies of financial crises from 1800 to 2010.

Figure 2: The Frequency of Financial crises from 1800-2010



The Frequency of Financial crises from 1800-2010, Data Font: (Qian, 2010)
Source: (Schularick & Taylor, 2012)

[12] Financial crises are defined as any of a broad variety of situations in which an asset suddenly loses a large part of the nominal value. Examples of financial crisis include banking crisis, sovereign debt crisis and currency crisis.

Figure 3: Number of financial crises, sample of 20 OECD countries

Australia	1893	1989	-	-	-	-	-	-	-	2
Austria	1873	1924	1929	2008	-	-	-	-	-	4
Belgium	1870	1885	1925	1931	1934	1939	2008	-	-	7
Canada	1873	1907	1923	-	-	-	-	-	-	3
Denmark	1877	1885	1908	1921	1931	1987	2008	-	-	7
Finland	1877	1900	1921	1931	1991	-	-	-	-	5
France	1882	1889	1930	2008	-	-	-	-	-	4
Germany	1873	1891	1901	1907	1931	2008	-	-	-	6
Greece	1931	1991	2008	-	-	-	-	-	-	3
Italy	1873	1887	1893	1907	1921	1930	1935	1990	2008	9
Japan	1871	1890	1907	1920	1927	1997	-	-	-	6
Netherlands	1893	1907	1921	1939	2008	-	-	-	-	5
Norway	1899	1922	1931	1988	-	-	-	-	-	4
Portugal	1890	1920	1923	1931	2008	-	-	-	-	5
Spain	1883	1890	1913	1920	1924	1931	1977	2008	-	8
Sweden	1878	1907	1922	1931	1991	2008	-	-	-	6
Switzerland	1870	1910	1931	1991	2008	-	-	-	-	5
UK	1890	1974	1991	2007	-	-	-	-	-	4
US	1873	1893	1907	1929	1984	2007	-	-	-	6

Number of financial crises, Sample of 20 OECD countries.
Data Font:http://www.macrohistory.net/data/ Source:Own made.

It is quite surprising and a mystery that from the periods from the 1940s to the 1970s, there were no financial crises in the high-income economies and marginal crises in the middle and low-income economies. Moreover, in that three-decade window, the world economy experienced a phase of high economic growth, technological improvement, and convergence of the world economy in general. One possible explanation of the lack of financial crises during the periods are regulations by national's government that prevented the build-up of credits booms and bust cycles that had recently affected the world economy in the 19th Century and the Interwar period, finally, the financial system during the period was characterized by low leverage due to the regulators' constraint and capital restriction that prevented the massive inflow of foreign capital. This can be related with the condition of the international monetary and financial system; at the time (1950's to 1970's) we had a type C system-The Bretton Woods.

Despite the differences between type A (Gold Standard) and type B (Current system in some countries), both have surprisingly cyclical financial crises; graphically, it looks like that both systems prompt crises.

The analysis approaches

Intuitively, we can say that the Bretton Woods would be the period with less capital mobility because there was restriction of it. Then, the Gold Standard and The Current System might be the periods with the highest capital mobility, but the degree of freedom would depend on international market integration. So, if capital control does not exist, then the period with the highest global integration will be the most freed in terms of capital mobility.

Again, if we want to prove the capital mobility, we will use the F-H test. However, since this paper will analyze the period, so cross-sectional analysis will be useless. The most efficient model must be a panel model because we will be dealing with n identities and t periods.

There are three approaches to analyze the panel data. The first one and probably the less fit is the Independent Pooled Model. This model consists of having a sample randomly selected from a large population at a different point of time (Wooldridge, 2012). For example, every year we select a random sample and measure the saving rates and investment rates.

$$(I/Y)_{i,t} = a^{pool} + b^{pool}(S/Y)_{i,t} \ + u_{i,t}$$

The second approach is known as the Fixed Effect Model or the *within* estimator. This model will remove from the data the unobserved variables that are constant across individuals (in our case, countries). They have a fixed effect, so any change to an individual, it will be the same. For example, any effect for being a landlocked country, an OECD country...will not change over time.

$$(I/Y)_{i,t} = a^{FEM} + b^{FEM}(S/Y)_{i,t} \ + u_{i,t}$$

The third approach is known as the Random Effect Model, it is attractive when we think the unobserved effect is uncorrelated with all the explanatory variables (Wooldridge, 2006). It is like the opposite to the *within* estimator, the unobserved variable does affect the results. For instance, the price of a meal varies depending on the location.

$$(I/Y)_{i,t} = a^{REM} + b^{REM}(S/Y)_{i,t} + u_{i,t}$$

The question now is which approach is the most fitted for our data set. We know that the Pooled estimator will certainly be unfit for our data set, but we can test it with the Breusch-Pagan Test (The null hypothesis is Pooled estimator, and the alternative hypothesis is Fixed/Random Effect Model).

Then the Hausman Test (The null hypothesis is Random Effect Model and the alternative hypothesis Fixed Effect) A rejection using the Hausman test is taken to mean that the key Random Effect assumption is false, and then the FE estimates are used (Wooldridge, 2012).

The procedure of this section will, first, explain the main characteristics of the period. Then we will proceed with the Breusch-Pagan Test (To check if it fits pooled or others). Finally, in the case that we reject the hypothesis we will proceed with the Hausman Test. Individually, the results will not tell much but we can use it to compare across the periods and support our idea.

The subsample we will use to determine the b will be as follows:

- First, this paper will analyze the Gold System. We will model the period, so from 1870's to 1914 and 1925s to 1931. Then we will do it separately for the first period (1870's to 1914) and the second period (1925s to 1936).

- Second, we will analyze the Bretton Woods period from 1955 to 1971 (Although the period started in 1944, we will exclude from 1945 to 1955 to avoid the effects of WWII and the period of reconstruction).

- Finally, we will analyze the current period from the 1980 to 2016.

The Gold System (1870ôs to 1914 and 1925s to

The Gold System period can be subdivided into two different periods; the first one is the Gold Standard System (1870's to 1914), then the First World War hit, and we have a period of floating exchange rate due to the inability of the European countries to commit[13] to the system, after the war, countries tried to re-enter the system, but the international environment changed dramatically and during this period there were serious economic imbalances between countries. Moreover, there were changes between the economic centers, from London to New York. Some minor changes in the functioning system also appeared; the first one is the inability of individual citizens to exchange paper money for gold.

As a whole, the Gold Standard System had a b^{REM} of approximately 0.56, Since the tests have shown that the best estimator is the Random Fixed Effect. Taking into face value, the interpretation is that if savings increases by 1pp then investment on average would increase by 0.56pp, in this sense, we can say that during the period there was high capital mobility (If we take the approach of b closer to one means capital immobility and lower betas as high capital mobility).

Gold Standard (1870-1914, 1925-1936)

Models	Coefficient	Std. Error	T-ratio	P-value	R-square
Pooled OLS	0.529438	0.0237783	22.27	7.68e-87 ***	0.368933
Fixed Effect	0.565654	0.0229897	24.6	2.95e-101 ***	0.473939
Random Effect	0.565393	0.0229691	24.62	2.24e-101 ***	#N/A
Test	**H_0**	**H_1**	**Chi-square**	**P-value**	**Result**
Breusch-Pagan test	Pooled OLS	FEM/REM	3114.51	0	H_0 Rejected,FEM/REM
Hausman test	REM	FEM	0.162394	0.686962	H_0 Accepted, REM

Note: The data is from www.macrohistory.net (see *Appendix*). Source: Own Made

The pre-1914 system was operated very smoothly (beating the expectation) and still nowadays is a mystery of economic studies. Some speculation is that the relatively good relationship between countries helped to maintain the system, there was cooperation among NCB's and governments were committed-specially France, UK, and Germany- to a narrow

[13] The system consisted that the amount of gold that NCB had must be equal to the value of all bills in circulation; during WWI, national governments needed to finance the world by printing money and thus NCB were not able to maintain the pegged.

pegged to the Gold in an environment of free capital mobility. (Eichengreen, 1992) focuses on the commitment by governments and cooperation among central banks as the main pillar of the regime. Also, during this period, a high percentage of the GDP was devoted to the international capital flow, especially the UK, which was the core of the world economy at the time. The UK balance of payment provided a loanable fund to the world market that was channeled in the City of London.

ñGross (and net) inflows were large even current account deficit (relative to GDP) in the principal receiving countries such as Argentina, Australia, Canada, New Zealand, and the US (although in the latter this was mainly before1860), was on the order of three percent and much higher in many years. In the so-called periphery, the levels were somewhat lower in absolute value but still significant in certain years. Foreign investment often accounted for about 20 percent of gross investment in the typical developing country of the time and up to 50 percent in Argentina, Australia, Brazil, and Canada.Great Britain exported the majority of capital flows while France, Germany, Belgium, and Holland provided smaller amounts. In Great Britain, the current account surplus never fell below one percent of GDP and averaged over four percent of GDP the entire period. France was the second-largest capital exporter at the time. The volumes exported were about half those of Britain. (Meissner, 2013)

As for the period of the *belle époque* (1870-1914), we can observe that capital mobility was quite mobile in contrast to the period. b^{REM}(As before the best estimator is the REM) is 0.51 in contrast to 0.56.

Gold Standard System (1870-1914)					
Models	**Coefficient**	**Std.Error**	**T-ratio**	**P-Value**	**R-Square**
Pooled OLS	0.441596	0.0287792	5.34	9.63e-46 ***	0.260609
Fixed Effect	0.514416	0.0276507	18.6	1.58e-62 ***	0.404577
Random Effect	0.513626	0.0276237	8.59	1.66e-62 ***	#N/A
Test	**H_0**	**H_1**	**Chi-Square**	**P-value**	**Results**
Breuch-Pagan test	Pooled OLS	FEM/REM	2484.77	0	H_0 Rejected,FEM/REM
Hausman test	REM	FEM	0.605162	0.436615	H_0 Accepted, REM

Note: The data is from www.macrohistory.net (see *Appendix*). Source: Own Made

The interwar period system in contrast to the previous system was characterized by instability, first, the cooperation and commitment of national institutions all but disappeared. The new kingmaker, the US was not as cooperative and committed to world stability as the

British empire and the axis of London-Paris-Berlin, which previously enabled cooperation, conflicted due to the scars of the war (*The interwar lack of confidence problem)*. Furthermore, lack of anticipation and organization to re-enter the gold standard created global imbalances; the British pound entered as an overvalued currency and therefore it ran important trade deficits, meanwhile, the FF entered the gold system undervalued and therefore it had trade surpluses and in contrast to the pre-war system, there was gold accumulation by some countries (France and US mainly)-*Adjustment problem.*

Finally, there was a liquidity problem, at the prevailing set of gold parity, it was inadequate to finance the economic growth, trade increase, and serve as the national currency backer. There was a deflationary bias in the system that would have an effect in the Great Depression.

Gold Exchange System (1925-1936)

Models	Coefficient	Std. Error	T-ratio	P-value	R-square
Pooled OLS	0.768223	0.0346152	22.19	3.78e-53 ***	0.734542
Fixed Effect	0.761365	0.0334339	22.77	1.73e-54 ***	0.754464
Random Effect	#N/A	#N/A	#N/A	#N/A	#N/A

Test	H_0	H_1	Chi-square	P-value	Result
Breusch-Pagan test	Pooled OLS	FEM/REM	#N/A	#N/A	Omitting group means regression
Hausman test	REM	FEM	#N/A	#N/A	Omitting group means regression

Comment: Omitting group means regression due to insufficient degrees of freedom

Note: The data is from www.macrohistory.net (see *Appendix*). Source: Own Made

As for the interwar period, we cannot get the proper tests (Hausman and Breusch-Pagan) nor the Random Effect Model, because there are countries that have data omitted or nor available. Nevertheless, it still shows differences between the first period and the interwar period. As a whole, the Gold Systems period had an average of 0.56, the Gold Standard 0.51but the interwar period had a b of around 0.76, significantly larger and with an interpretation of considerably lower capital mobility.

The Bretton Woods Agreement 1944-1971

The Bretton Woods Agreement aimed to create a new international monetary order to avoid the mistakes of the interwar period. It aimed to create a stable exchange rate, national full employment policies (or Keynesian policies), and cooperation. After WWII, the United States rose as the world's richest and strongest country, and therefore it was expected to be the creditor of the world.

Bretton Woods (1955-1971)					
Models	**Coefficient**	**Std. Error**	**T-ratio**	**P-value**	**R-square**
Pooled OLS	0.87678	0.0256391	34.2	3.12e-103 ***	0.802943
Fixed Effect	0.792468	0.034321	23.09	5.86e-66 ***	0.887627
Random Effect	0.809173	0.0320323	25.26	6.44e-75 ***	#N/A
Test	**H_0**	**H_1**	**Chi-square**	**P-value**	**Result**
Breusch-Pagan test	Pooled OLS	FEM/REM	334.925	8.13E-75	H_0 is rejected, FEM/REM
Hausman test	REM	FEM	1.82244	0.177023	H_0 is accepted, REM

Note: The data is from www.macrohistory.net (see *Appendix*). Source: Own Made

As for the Bretton Woods period, the capital mobility is closed to unity. The b^{REM}(the best estimator, so unbiased and most efficient estimator) is 0.81 approximately, which indicates low capital mobility. In comparison, the b of the Gold System was 0.56 as a whole, if we separate the Gold System, we have that the Gold Standard System has a b of 0.51 and the Gold Exchange System has a b of 0.76.

The architects of the new system aimed that every currency of the world (or at least the Western countries) was equal and the duties of each government were to ensure the pair value, even if the other nation had to help the country with the problem. The reality, the US was the main holder of the gold reserve and therefore other countries pegged their currency to the dollar, which was the only currency convertible to gold, and governments needed to intervene if the exchange rate varied by 1%. The second idea was to create an international fund (International Monetary Fund), each country would deposit their reserve and in the case of balance of payment deficit withdraw to cover the deficit if the problem persisted then governments needed to alter fiscal policy, and if the problem was a fundamental disequilibrium, then the country should alter the parity until reaching the new equilibrium.
The third mechanism was capital controls, to avoid speculative attacks against a country and avoid unilateral and premature alteration of the exchange rate.

This period can be divided into 2 periods; the first one; The Pre-Convertibility Period 1946- 1958, and the second one The Convertibility Period 1959-1971. The first period is the transition period in which European countries tried to adjust the new order and rebuild their economies. This period had two main problems: bilateralism and shortage of dollars, the United States after the war had almost ⅔ of the gold reserve, and the European countries had massive current account deficits to maintain the supply of essential goods therefore some countries implemented temporary trade restrictions.
The Second period was the Convertibility Period, this period European countries achieved the conditions necessary to maintain a pair value with the dollar, this period can be considered as the Heyday of the Bretton woods agreement.

From 1968 to 1971, the system started to crack due to the expansionary policies of the United States to finance the Vietnam War and welfare programs, this created inflation due to the expansionary policies of the Federal Reserve, which was more important full employment policies than price control policy. Adding on top of that, the productivity growth of countries like West Germany and Japan implied a loss of the US competitiveness that translated to a shrink of the US Balance of payment surplus. The pressure of a revaluation of the dollar was mounting but several attempts[14] were done before the 1971 suspension of the USD convertibility to gold, the system then collapsed.

The Current Monetary and Financial System (1980-now)

In the 2015 Annual Conference of the Bank of International Settlement, William White described the current international monetary and financial system as "*We do not have an international monetary system, we have a kind of monetary non-system. There are no rules out there, everybody can do whatever they want, and they are. What this means is that this international monetary system has got very bad characteristics. One, there is no automatic rebalancing of the current account balances, it does not happen automatically. Second, there are material international spillovers for easy money in big countries. A third characteristic, the whole economic and financial system are dangerously unanchored, actors can do whatever*

[14] The creation of the SDR, a new asset that was composed of a basket of currency, alleviating the pressure of the USD.

they want and lastly, in the event of something going wrong in this non-monetary system, there is no lender of last resorté " (White, 2015).

Maurice Oberstfeld in the paper "The international monetary system: Living in asymmetry" described the current system and its failure: *ñ Despite the progress financial innovation, globalization, and development, sharp international asymmetries remain and thus coordination failures with recognizable analogs in earlier historical eras have emerged. Previous efforts at international monetary reform attempted to reconcile individual domestic (Kamp, 2017) economic stability with a smooth international adjustment mechanism. Those attempts had limited success and even the most ambitious and successful of themð the Bretton Woods systemð crumbled after a quarter-century under the weight of its internal contradictions. The recent global crisis has highlighted the twenty-first-century incarnations of a range of time-honored systemic strains. Some of the problems have become more severe, or problematic in new ways. The resulting pressures on international economic relations define the needs for*

The First problem that Oberstfeld and White described is the current account imbalances of the developed countries, the United States, in particular, has had since the 1990's a widening of the current account deficit and there is no automatic balancing, furthermore, even with a huge trade deficit policy implemented by the US government lacks effectiveness. (i.e., Trump administration trade war). Another problem that affects most of the OECD countries is the increasing deficits of the public administration and therefore the alarming debt accumulation by certain countries.

The second problem is that every actor can do whatever they want, there is a lack of cooperation among countries; every country is on their own. One example is with the EU, after the collapse of the Bretton Woods Agreement (BWA), the EEC (current EU) created the European Snake that tried to simulate the functioning of the BWA, although there were significant changes. The European Monetary System, which had the German Mark as the new "Dollar" in the Union, collapsed in 1992 when the UK and Italy suffered speculative attacks and had to withdraw from the EMS. Later in 1999, the EU implemented a new currency "EURO" that was characterized by the fixed exchange rate, and free movement of capital, therefore the European Central Bank was created as the responsible for monetary policy in the Eurozone (The national governments have no longer power on monetary policy under ECB).

Meanwhile, the United States implemented the free capital of movement and independent monetary policy (floating exchange rate). China, the new power of the 21st century has a different monetary policy, it tries to balance the impossible trinity, to achieve the 3 corners, on April 5th, 2017, "*A claim by China's Central Bank that it can have a stable yuan, open borders and control of its interests-is nonsense.*" wrote Jake Van der Kamp, reporter of the South China Morning Post[15]. As we can see, each country tries to pursue its policy but *de facto* the dominant position is free trade and independent monetary policy, the ECB as a block can determine its interest rate as the Federal Reserve, moreover, EURUSD has no fixed exchange regime and finally there is free movement of capital across the two. Japan's third economy has the same policy in terms of the impossible trinity as the United States. The case of China is more difficult to determine but it looks like they are in *a de facto* fixed exchange rate and thus independent monetary policy and free capital movement.

"During the period to 2014, significantly flowing out from China. The current account surplus (which stemmed simplistically means that the value of China foreign investors' demand for floating exchange rates, this would have resulted in a significantly larger appreciation in China's what was observed. Instead, China kept a relatively fixed exchange rate system by selling Renminbi (and buying foreign currency, or "f the rate of demand growth for its domestic currency. Hence, the significant build-up in foreign reserves to over US$4 trillion." (Macken,2014).

In respect to capital mobility, we can see that this period has the highest mobility the b^{REM} (the best estimator, so unbiased and most efficient estimator) is 0.34. In contrast, the Gold System 0.51 (Gold Standard System, 1870-1914 is 0.56 and Gold Exchange Rate,1925-1936 is 0.76) and the Bretton Woods is 0.81. So, we can conclude that this period is the age of highest mobility and Bretton Woods the lowest.

[15] South China Morning post is a Hong Kong's English language newspaper.

Current IMFS (1980-Now)					
Models	**Coefficient**	**Std. Error**	**T-ratio**	**P-value**	**R-square**
Pooled OLS	0.317333	0.0206225	15.39	1.46e-45 ***	0.274121
Fixed Effect	0.343363	0.0278262	12.34	2.16e-31 ***	0.511924
Random Effect	0.340152	0.0267215	12.73	3.52e-33 ***	#N/A
Test	**H_0**	**H_1**	**Chi-square**	**P-value**	**Result**
Breusch-Pagar	Pooled OLS	FEM/REM	1073.63	1.78E-235	H_0 is rejected, FEM/REM
Hausman test	REM	FEM	0.174656	0.676006	H_0 is accepted, REM

Note: The data is from www.macrohistory.net (see *Appendix*). Source: Own Made

To conclude, we observe that nowadays there is no international financial system, there is a lack of international monetary cooperation among countries and free movement of capital can exacerbate domestic financial weaknesses. This situation is reminiscent of the 1920s when each country applied its policies and ended up with a financial bubble fueled partially by the easiness of credit access to invest in the stock market[16], consumption goods, and housing. It is a similar situation to the housing bubble where loans only were accepted if there was a collateral asset that back the credit, even if it was a risky asset[17]

THE HYPOTHESIS OF THE GLOBAL SAVING GLUT THEORY AND THE FORMATION OF BUBBLES

ñ The weakening of new capital investment (referring to the Dotcom crisis and the 2001 Recession*) did not much change the net effect of the global saving glut on the U.S. current account. The transmission mechanism changed, however, as low real interest rates rather than high stock prices became a principal cause of lower U.S. saving. In particular, during the past few years, the key asset-price effects of the global saving glut appear to have occurred in the market for residential investment, as low mortgage rates have supported record levels of home construction and strong gains in housing prices. Indeed, increases in home values, together with a stock-market recovery that began in 2003, have recently returned the wealth-to-income ratio of U.S. households to 5.4, not far from its peak value of 6.2 in 1999 and above its long-run (1960-2003) average of 4.8. The expansion of U.S. housing wealth, much of it easily accessible to households through cash-out refinancing and*

[16] The credits for investing the stock market only occurred in the state of New York, specifically New York City

[17] In 1929 the risky asset would be the stock and in 2008 would be housing.

home equity lines of credit, has kept the U.S. national saving rate low--and indeed, together with th e s (Bernanke, 2005).

In the 2005 infamous speech by back then Chairman of the Federal Reserve, Ben S. Bernanke attributed the price boom of the housing market to an influx of foreign capital that pushed interest rates lower that stimulated the borrowing of loans to buy residential investment. The influx of foreign capital was propelled by exogenous (to the US) events, such as, financial crises that change the pattern of the emerging markets, from being net borrowers to net lenders. This event had a profound impact on the current account of the US, that during the decade went from surplus to deficit, at the same time the transmission of this sudden influx was through endogenous changes on equity prices, real exchange rates, US exchange rate.

The last emphasis that Benanke made is that the deficit of the US government during the Bush Tax cuts "*actually prevented the creation of a bigger housing bubble*" by draining the global saving glut.

Implicitly, Bernanke assumes that any decrease in the US budget deficit would have a big impact on world interest rates and, in turn falls in the world interest rate would have a big impact on US investment and on US consumption -- helped along by things like interest-only mortgages. In formal terms, the elasticities need to be large. (Setser, 2005)

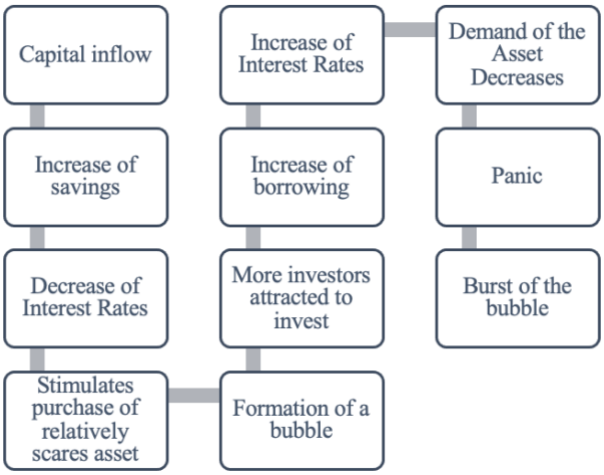
The hypothesis of this work is the same as Bernanke's idea of the Global Saving Glut that exacerbated domestic weaknesses and asset bubbles fueled by *foreign* cheap credit. The idea is that without an IMFS that allowed an uncontrolled capital movement, the sudden increase in equity prices would not exist and therefore the crises caused by a credit crunch due to a sudden decrease in the collateral asset.
The detailed hypothesis, which this paper will try to prove is as follows.

An event outside of the domestic borders, translates to a sudden influx of capital in the home country, as consequence, the aggregate savings[18] in the home country increases, this increase shifts the savings curve. The borrowing curve remains the same and therefore there is a decrease of interest rates. The decline of interest rates implies that borrowing cost decreases

[18] The aggregate savings of the capital market is the sum of the domestic savings (either public or private) and the foreign savings that seek to invest in the home country.

and therefore stimulates the demand of certain assets that can be used as collateral (House or stock).-Thus far, it follows the idea of the Global Saving Glut by Bernanke.-However, we can extend the hypothesis and state the following: At the event of an increase of demand of the certain asset and the subsequent formation of the bubble, the demand of the savings (the borrowing curve) increases and thus an increase of the interest rate, this will cause that the demand of that asset is less attractive for the investors and therefore a decrease of the asset demand, this will translate to a decrease on the price and finally a panic among investors to sell, and finally, prices collapse.

Figure 4: The Capital effect on the creation of bubbles, a comprehensive diagram



The Capital effect on the creation of bubbles, a comprehensive diagram, source: Own Made

The idea of the Global Saving Glut is usually applied to the Great Recession of the 2007/8, but what if we can use this hypothesis to describe the best-known crisis in history? Of course, we are referring to the Great Depression of the 30's.

For now, we have shown that capital mobility "degree" moves significantly across history, specifically following changes on the IMFS. Also, we have proved that Bretton Woods was the only period in recent history that the world has not experienced any financial crises. Coincidentally, the system in which the Bretton Woods is known was capital control and cooperation among countries through international institutions (like the IMF or the World Bank).

THE ROLE OF CAPITAL MOBILITY & GLOBAL SAVING GLUT HYPOTHESIS IN THE *GREAT CRISES*

In this part we must describe the event of the seminal *Great Crises* in recent world history, specifically in the context of the Global Saving Glut hypothesis.

The Great Depression (1929-1933)

First this paper will analyze the Great Depression, specifically, the role that capital might play on the bubble and the financial crisis.

Before analyzing the seminal economic disaster of the roaring 20's and the 30's, we have to explain the consequences of WWI. Out of many consequences, the most important one for this paper is the change of the US position in the international capital market, from a debt position to a credit position.

"*The war transformed the United States from a net debtor to a creditor nation: between 1914 and 1919, largely as a result of loans floated on behalf of the French and British governments, Americaôs net debtor position w position of comparable magnitude*" (Eichengreen, The Gold-Exchange Standard and the Great Depression, 1987)

After the war, the US was in a hegemonic position in economic terms, but the international capital market remained becalmed. The difference of rate of returns might have reignited some US foreign lending, however the role of other factors like risk played a more important role, by 1923 the US investors were virtually unwilling to lend to foreigners at any price. So long, the international market was in disarray and the doubts about the ability of other countries to generate revenue through trade surplus, the international capital market would remain dried. By the mid 1920's, the world situation improved greatly thanks partially to the League of Nations program of stabilization loans, moreover, the financial innovations of the 1920's stimulated the investment on the international capital market.

"*The growth of the investment trust enabled the small investor to participate in the market. Together, the rapid development of retailing and underwriting activities and the proliferation of investment vehicles provided organizations and individuals both the incentive and the opportunity to increase their participation in foreign bond markets*. (Eichengreen, 1987).

In the table shown below[19], it is shown that from 1923 to 1924, the amount of foreign lending more than doubled, from 413.3 million to 961.3 million. If we compare the same figure to 1927, the amount tripled in 3 years, from 413.3 in 1923 to 1,304.6.

Furthermore, the averages of the 1920/24 period and the 1925/28 shows that it is consistently larger in the latter (so an increase in US investment abroad). 633.1 million on average in the 1920-1924 period, 1,181.4 (Almost doubled).

Most of the capital went to Europe (around 45%), Canada (around 25%), Latin America (around 20%) and Asia (around 10%). However, in 1929, the capital crashed to 658.2 million (50% drop). By 1929, Europe was no longer the predominant region that US investors invest, there was a drop in the share from 48% in 1928 to 21.5% in 1929.

Figure 5: Distribution of foreign issuing between 1919-1929

(percentages of total, total in millions)

Year	Europe (%)	Canada (%)	Latin America (%)	Asia (%)	Total ($m)
1919	60.3	30.4	8.9	0.2	377.5
1920	51.5	38.2	10.1	0.0	480.4
1921	26.2	32.5	38.6	2.5	594.7
1922	29.2	23.5	31.2	15.6	715.8
1923	26.1	29.0	27.2	17.0	413.3
1924	54.7	15.7	19.4	9.9	961.3
1925	58.9	12.8	14.8	13.2	1067.1
1926	43.5	20.3	33.1	2.8	1110.2
1927	44.2	18.1	26.0	11.5	1304.6
1928	48.0	14.8	26.5	10.5	1243.7
1929	21.5	44.0	26.5	7.8	658.2

Source: Computed from U.S. Dept. of Commerce, *American Underwriting* of *Foreign Securities* (various issues), *Historical Statistics* of *the United States* (1976). *Note:* Percentages may not sum to 100 because of rounding.

[19] Table of Distribution of American Foreign Security Issues,1919-20.

Europe Credit Position 1924-1930			
Europe: *Creditors*		Europe: *Debtors*	
UK	1300	Germany	-4190
France	1340	Austria	-860
Netherlands	380	Italy	-710
Switzerland	370	Romania	-440
Czechoslovakia	250	Poland	-400
Sweden	180	Hungary	-320
Ireland	30	Greece	-310
		Belgium	-240
		Norway	-140
		Yugoslavia	-80
		Bulgaria	-50
		Finland	-40
		Denmark	-40
Total	3850		-7820
Europe's Total		-3970	

Figure 6. Source: Computed from: *Banking, Currency, and Finance in Europe Between the Wars*, Charles H. Feinstein (1995).

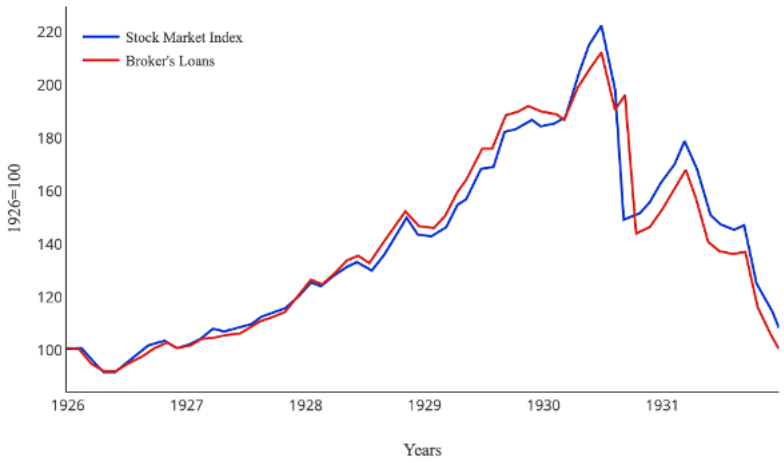
Analyzing Europe as a continent, we can see that half of Europe financed the other part of the continent. The combined countries that had a credit account amounted to almost 3,850 million dollars. Meanwhile, the debtor side amounted to -7,820 million dollars (more than 50% came from Germany). The continent had a negative -3,970 million dollars. Most of the capital came from the US, where the appetite of the American investor never seemed to have a limit regarding German bonds regardless of the purpose of the loans or the interest earned by placing the capital in German bank accounts. (Feinstein,1995).

As for the United States, the US economy was prosperous after WWI, the GDP grew on average 4.7% annually and unemployment rates stayed an average of 3.7%. Part of the growth was due to business taking advantage of new technological processes that enabled advantage of economies of scale and scope (apparition of vertically integrated companies). The rise of new enterprises created an unprecedented financial need, but the regulations of the nineteenth century prevented the purchase of equity and the ability to provide long term debt[20]. To circumvent this problem, most commercial banks created affiliates that the sole purpose of it was to buy securities, thus allowing them de facto to provide services from financial banks. These affiliates attracted many new customers and became big distributors of stocks and bonds, enabling them to become underwriters. Still, this financial innovation did not include small

[20] Federal government prohibited lending more than 10% of their capital to one customer, and restrictions by state governments prevented nominally long-term lending.

investors until the advent of investment trust[21]According to Carosso (1970), investment trusts grew from about 40 in 1921 to over 750 in 1929. Furthermore, the role of broker loans and margin purchase increased the demand for securities, allowing access to customers that due to their low capital and financial capacity would not enter and at the same time providing them leverage to trade in the market was an error because these individuals could not repay the debt with their assets and after the crash the collateral value decrease more than the total debt outstanding, thus creating instability that led to the Great Depression. After the crash, Irving Fisher described that the major problem with the "unwise" speculation in the long bull market was the use of so much borrowed money.

Figure 7: S t o c k P r i c e a n d B r o k e r ô s L o a n s



Stock Price and Broker's Loans, Data Font: Board of Governors of the Federal Reserve System (1943) & The New York Stock Exchange Yearbook (1931), Source: White (1990)

Historians acknowledge that during this period there was credit flexibility, and (Kindleberger, 1973) identifies that the rising supply of loans from non-financial institutions as responsible for fueling the stock market.

To analyze the credit booms, we can use the Real Credit to GDP and compere the long term trend (Mendoza & Terrones, 2012) to define an episode as a credit boom when the amount of credit extended by the banking system to the private sector grows by more than that experienced during a typical cyclical expansion.

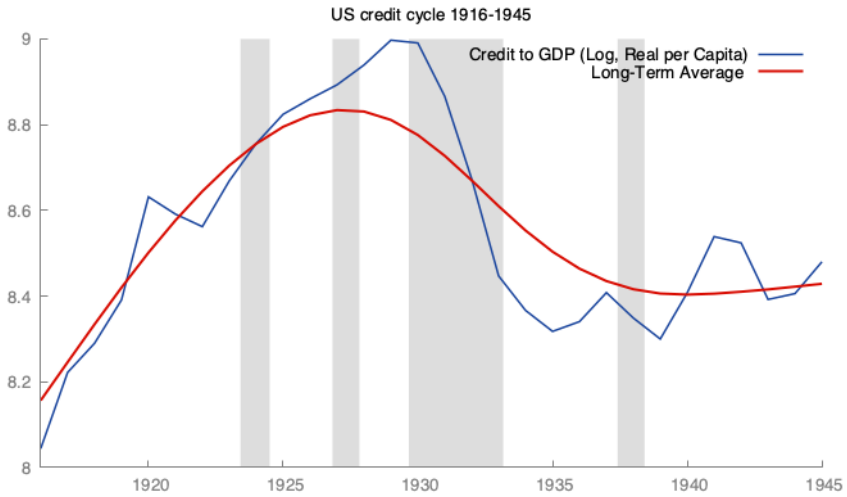
[21] Investment trusts were primarily institutions that sold securities to the public and used the proceeds to invest in stocks and bonds. There were two main types: management trusts where managers had discretion over the portfolio and fixed trusts where the portfolio could not be changed.

Therefore, we need to analyze the credit cycle on the long run to see what the average is and determine the existence of a credit boom for the period. The Hodrick-Prescott (HP) filter will be useful to determine it.

The data used for the period from 1916-1945 came from the database of microhistory (Jordà et al), we use loans to non-financial institutions as a proxy variable of total private credit, we have divided the total loans by the population to get credit per capita. Then, we divided the CPI (2010=100) to get the Real Credit to Capita, finally we use the Napierian logarithm to get the line.

The methodology follows the threshold approach by Mendoza and Terrones and they define as follows, the long run is calculated by the HP filter and denotes the long-term trend, any credit boom is a significant and contiguous deviation from the trend, so we must observe an area that is above the smoothed trend.

Figure 8: The credit cycle of the US 1916-1945



The Credit Cycle of the US 1916-1945, Data: www.macroeconomichistory.com .
Font: Own Made

In the graph we can observe that during the period of 1925-1930, the US experienced a period of credit boom, at the same time, experienced an outflow of capital towards other nations. This situation could infer that (i) the US capital stock (savings) increased significantly and therefore explaining the credit boom, (ii) Although the demand for credit increased, the capital stock increased at a much rapid pace. So, savings was much greater than domestic investment (the Global/ "American" Saving Glut Hypothesis) consequently, the US

experienced outflow of capital towards more profitable countries. (iii) Timing coincides with the increase of US foreign investments abroad, the stock bubble and the burst of the bubble. As mentioned above, US investment abroad picked up in the 1925/26 and collapsed in 1929/30 approximately after the stock market crash. This could be an indicator that the stock market rally and the frenzy by the US investor to invest abroad were fueled by the easiness to access credit.

The Great Recession (2007-2009)

Many comparisons have been drawn between the Great Recession and the Great Depression. As Eichegreen pointed out, many commentators have remarked the similarities between the crisis with the "Four bad bears", a graph that shows the S&P 500 for both periods and the same period for the Dow. Moreover, the naiveness of Central Bankers of both periods is shockingly similar that economic policy has tamed the economic cycle. In the 1920's, it was said that the world had entered a new "Economic Era" with economic stability with the establishment of the Central Banks and the FED. The naive idea was proven wrong in 1929. The same can be told in the early 2000's, in the gospel of the Great Moderation, an era of diminishing business cycle volatility due to advancement of Central banks. Once again, it was proven wrong with the collapse of Lehman Brother. The parallels of both crises cannot stop there, the role of the credit cycle, partially encouraged by the belief that sharp economic reversals were past stories, fueled asset bubbles (In 1929, Stock Market and in 2008 the Housing Market). The fundamentals seem equal, credit booms, a uncoordinated IMFS, new financial innovation and bad practices… generated the 2 most influential crises for economic history.

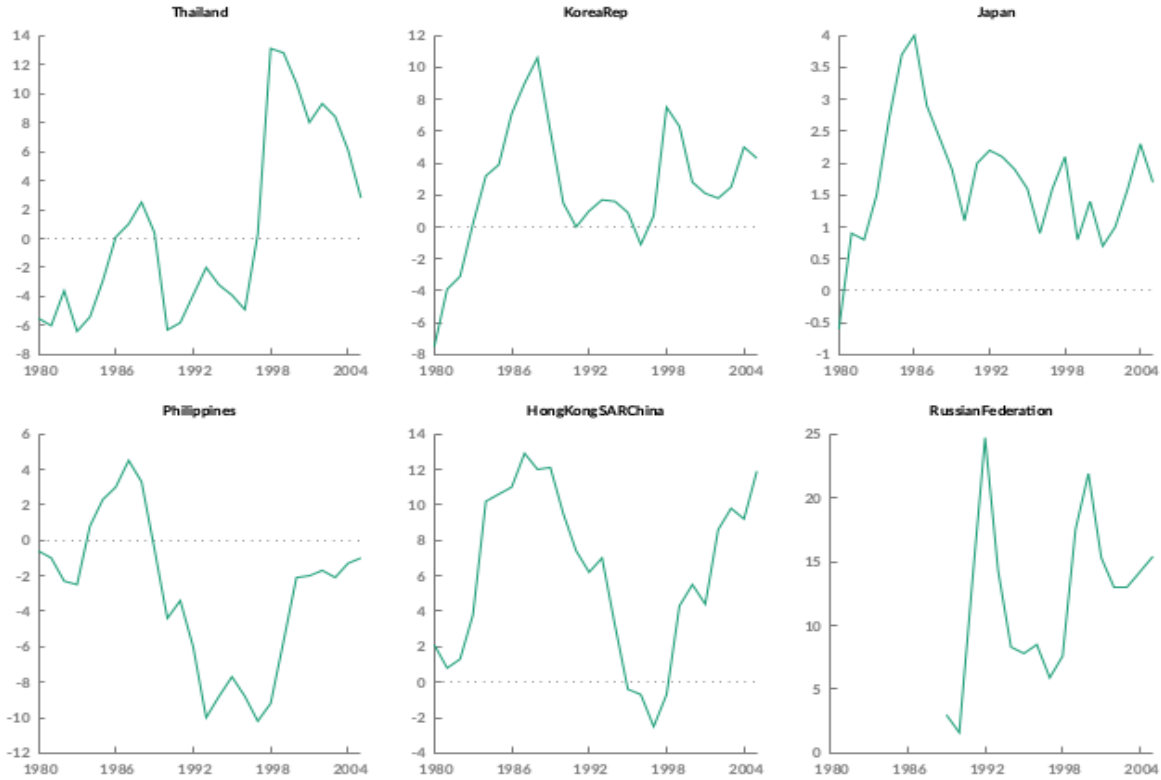
The optics of the Great Recession is "like a mirror hall" of the Great Depression, financial innovation, central banking policy and the relatively calmed years prior to the crises that lead to disastrous economic and social consequences across the world.

Once again, we must go back to find the roots of the crisis in the United States, that subsequently will bring the world to another crisis. On December 31st, 1991, the Soviet Union ceased to exist, capitalism won the cold war and the subsequent year, the world experienced a wave of globalization policy; NAFTA (1994), Maastricht Treaty (1992), China Globalization policy (1990's) ...The hegemony of the United States was unquestionable, and an era of new

economic stability propelled the US economy, the era of the Great Moderation for the Western Countries has started.

But first, massive crises in the developing world bring a change of paradigm for the US economy. One consequence of these series of crises was the increasing uncertainty by investors to lend money to those affected countries, as consequence net savings rates in Asia increased significantly due to new economic strategies focusing on being net exporters of capital, building up reserves and being less dependent of foreign capital. (Basco, 2011)

Figure 9: Net Savings of a sample of South-Asia Countries from 1980-2005



Net Savings of a sample of South-Asia Countries from 1980-2005, Data: World Bank data base.

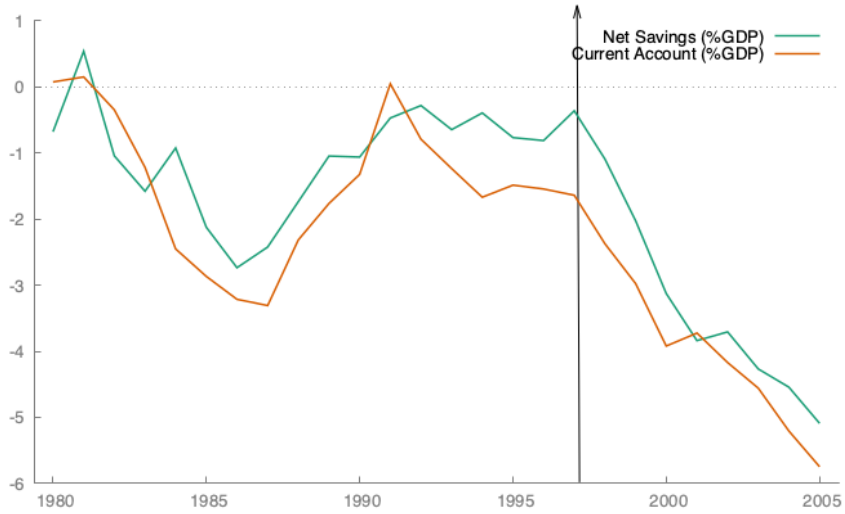
Font: Own Made

As we can observe in the graph, most countries had been experiencing a decline in the net savings rates from the late 80's, but suddenly we can see a sharp reversal from 1997 onwards. The sudden reversal will influence the US economy.

The first consequence is that the trade surplus of the Asian countries increased $(S - I) \uparrow = (X - M) \uparrow$. This increase of surplus must be met by a decrease on the trade surplus (or increase of deficit) of the other countries. The question is who was the country that absorbed it? The answer is the United States. Since 1998, the US current account deficit has been getting bigger and bigger. The timing coincides with the 1997 Asian crisis.

In 1997, the US had a deficit in the current account of -1.64% of GDP and net savings of -0.36, by 2005 the deficit almost quadrupled to 5.75% and a net savings of -5.09%.
Many economists have argued that the problem of the US deficit is related to a decrease in domestic savings, in 1985 domestic savings was 18% of the GDP, in 1995 16% and 2004 14%. (Bernanke, 2005).

Figure 10: Net Savings and Current Account



Net Savings and Current Account, Source: World Bank Data Base.

Font: Own Made

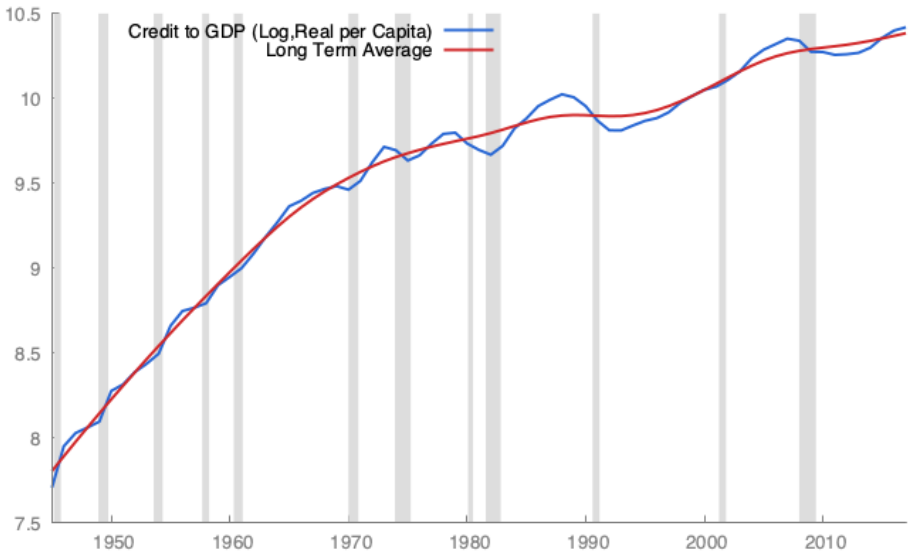
One possible explanation of this is the Global Saving Glut theory by Benrnake, basically the summary of it is that foreign capital attracted by US equity market decrease the interest rates during the period of Great Moderation, thus stimulating the demand of loans and the subsequently decrease of US domestic savings, the increase of cheap credit help to build up the asset bubbles. This situation was only possible due to the IMFS that allow capital mobility across the country. The idea is that the system allowed credit booms due to a sudden influx of foreign capital.

The non-economical analogy is with the debate of gun control and mass shooting in the US. The US is infamous for having periodic mass shootings (equivalent for us, financial crises), Canada has stricter gun control laws, and we observe that the rate of mass shooting is significantly below to the US. There are many explanations of why someone would kill indiscriminately but one of them is mental illness. Scientifically, the US is no more different than Canada so we would expect that gun violence in Canada should be similar than the US, but it is not because of the strict gun legislation. At the end, you cannot commit a mass shooting without a gun. The idea that this paper wants to extrapolate is that financial crises are inevitable, if it happens, but we can reduce the rate of it by creating cooperation mechanisms at the international level (even if capital control is an option).

We can observe the differences of it by looking at the credit booms that the US has experienced from 1945 to 2017.

In the figure 11, from 1945 to 1970, the credit cycle was similar at the long-term average, but after that we can see that there are credit booms, to be precise 4 different credit booms. In 1973, 1978-1979, 1980-1990 approximately and 2003 to 2008. Looking in the figure 12, we observe the credit boom of the 2003 to 2008

Figure 11: The credit cycle of the US 1945-2017



The credit cycle of the US 1945-2017, Data: www.macroeconomichistory.com .
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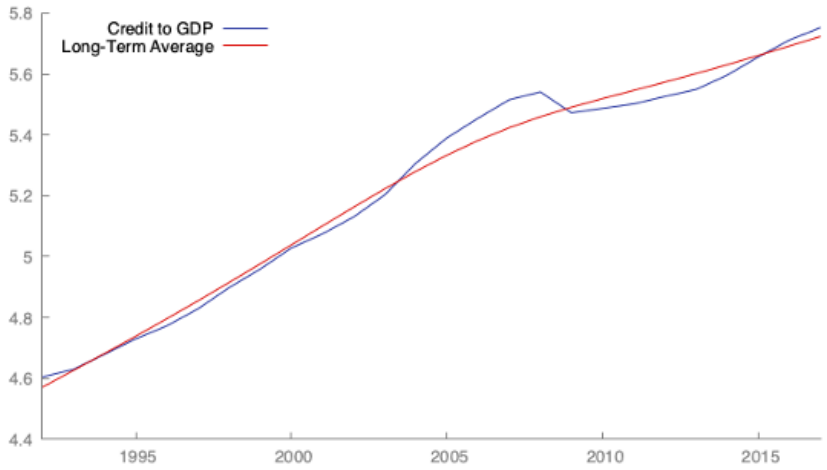
Figure 12: The credit cycle of the US 1992-20017



The credit cycle of the US 1992-2017, Data: www.macroeconomichistory.com .
Font: Own Made

In contrast to the Great Depression, the dynamics of the Capital flow changed, the United States was no longer the lender but the number one borrower. The consequence of the massive inflow of capital, exploited the domestic weaknesses by creating asset bubbles (Borio, 2015). Moreover, financial innovation allowed, like in the 1920's, the access to consumers that were financially incapable to pay back under the assumption that the collateral (the house) would increase forever.

Both crises are strikingly similar in the beginning, the diversion was in the response of it, one possible reason is that the chairman at the time, Bernanke, studied deeply the great depression and was willing to do "whatever it takes" to not commit the same mistakes. Still, an historical framework is not enough to prevent another bubble, many economists came up with different models to try to capture the essence of financial crises. One of the most understood models to recreate the formation is with the Overlapping Generation Model.

This paper will use the Basco (2014) model because it allows the formation of so-called rational bubbles, the distinction between different countries (Basco contemplates two types of countries) and the integration between those countries in the international capital market. Moreover, the model of Basco (2014) tries to capture the essence of the Global Saving Glut that the other models do not enter in the hypothesis.

THE GLOBAL SAVING GLUT AND ASSET BUBBLE FORMATION: AN OLG APPROACH

In the paper *Globalization and Financial development: A model of the Dot Com and the Housing crisis* (Basco,2014) extended the Overlapping Generation model to include the possibility of the formation of bubbles. The model has a three-time period; in the first period young agents earn a wage and borrow to purchase a house. In the second period, the middle age enjoys the house and lastly when old sells the house and spends all the savings. Although the model is only for the housing market, we can extend also to the stock market, particularly in the case of the roaring 20's because one assumption of Basco's work is capital constraint to finance a house when young and therefore collatization of debt arises. This assumption allows us to explain the soaring stock market in the 1920's due to the similarities between a stock and a house. In the 1920's, poor individuals (who had financial constraints) borrowed money from the broker, the debt was ensured by the collateral asset, which the broker assumed that price would continue to grow. In the 2000's a similar situation occurred, poor individuals with financial constraint were able to borrow to buy a house (which at the same time was the collateral), banks assumed that housing prices would grow forever. The only change was the asset type but the fundamental structure of debt collatization remain the same and both type of assets is considered *infinite*[22]. With the collatization of the debt, low interest rates will stimulate the demand of the asset in question, thus increasing the size of the bubble and attracting more potential investors. Anecdotally, we have the example of individuals that bought stocks in the stock boom of the 1920's because (mainly) his friend got rich because of it. In the 2000's the same happened, individuals bought houses, reformed and sold it weeks later with a profit.

The results of the model can be summarized as follows:

a) In autarky a financially developed country cannot have an asset bubble however financially underdeveloped could have asset bubbles.
b) As the globalization process increases in magnitude the possibility of asset bubbles increases along it.

[22] Infinite meaning that both are expected to endure for a long period of time

The model follows the following timing: the young is financially constrained, but it earns a salary because it is endowed with a unit of labor, however middle age and old do not have it. Young therefore must ask for a loan to purchase a house and enjoy it in the future. In middle age they enjoy the house and at the end of the period they sell the house. Finally, when old, they spent all the savings. The interpretation of this paper is not only for houses but also for stocks however the quantitative and qualitative calculations do not change. This timing tries to follow the life cycle; when young, we are underwater (the value of our "real owned "asset is below the liabilities), then we will arrive in the peak where our wealth is at the maximum and when old, we will use our accumulated capital for a retirement.

Setting up the model, the budget constraint:

When young, we need to buy a house that cost $p_t h_{t+1}$, the young agent will earn w_t and must borrow d_t but since the financial institution does not trust the young individual, it imposes a constraint so $d_t = \theta p_t h_{t+1}$ (collatization of debt arises).

$$p_t h_{t+1} \leq d_t + w_t \qquad (1)$$

In the middle age, they are able to build their savings (a_{t+1}) in order to have a pleasant retirement and therefore at the end of the period they are able to repay the debt with a interest $r_t d_t$, and sell the house at a higher price; $p_t h_{t+1} < p_{t+1} h_{t+1}$:

$$r_t d_t + a_{t+1} \leq (1-\delta) p_{t+1} h_{t+1} \qquad (2)$$

Finally in the third period, old, they spend all the savings by consuming it.

$$c_{3t+2} \leq r_{t+1} a_{t+1} \qquad (3)$$

The intertemporal constraint is

$$p_t - (1-\delta)\frac{p_{t+1}}{r_t} h_{2t+1} \frac{1}{r_t r_{t+1}} c_{3t+2} = w_t \qquad (4)$$

Moreover, Basco's model distinguishes between *financially developed* and financially *underdeveloped countries.* The difference between the first one and the second one is that the

financially developed have no constraint and the *financially underdeveloped countries* have constraint ($h_{2t+1} = \frac{\theta}{1-\theta}\frac{w_t}{p_t}$). The utility function is logarithmic, but it can be any kind, it is used for practical reasons.

The financially developed country

$$max\ \ U(h_{2t+1}, c_{3t+2}) = log(h_{2t+1}) + log(c_{3t+2})$$

$$\text{subject to. } \ p_t - (1-\delta)\frac{p_{t+1}}{r_t} h_{2t+1} \frac{1}{r_t r_{t+1}} c_{3t+2} = w_t$$

After calculations, we will have the following results:

$$d_t = \frac{w_t}{2}\left[\frac{2\frac{(1-\delta)p_{t+1}}{r_t} - p_t}{p_t - \frac{(1-\delta)p_{t+1}}{r_t}}\right]$$

Borrowing or supply of assets, it decreases with the interest rates and since borrowing is directly connected to the collateral asset then it decreases with the purchasing price (p_t) and increases with the discounted selling price $\frac{p_{t+1}}{r_t}$.

$$a_{t+1} = \frac{w_t}{2} \quad r_t$$

Savings or the demand of assets increases with the interest rates.

$$h_d = \frac{1}{2}\frac{w}{p - (1-\delta)\frac{p}{r}}$$

The demand function of the collateral asset (housing but also stocks) in the steady state is decreasing with the interest rates. The intuition behind is that if the cost of capital for a loan to buy a collateral asset decreases then it will encourage the demand for it. For instance, for

housing you will be encouraged to take a loan because it is cheaper. The same would happen to leverage your portfolio or enter the market though borrowing from the brokers.

The financial underdeveloped countries

Basco's work assumes that there is a continuum mass 1 of underdeveloped countries, hence the number of developed countries in a financial sense is smaller than the countries that are not fully developed in a financial sense. So, initially there is only a small number of countries that have access to the international monetary and financial system but with the process of globalization, more and more countries would have access to the international market, so more credit flows into the financial developed world.

The set-up of the problem of the financial underdeveloped country is

$$max\ \ U(h_{2t+1}, c_{3t+2}) = log(h_{2t+1}) + log(c_{3t+2})$$

$$\text{subject to. } p_t - (1-\delta)\frac{p_{t+1}}{r_t}h_{2t+1}\frac{1}{r_t r_{t+1}}c_{3t+2} = w_t$$

$$\text{Borrowing Constraint } h_{2,t+1} = \frac{1}{1-\theta}\frac{w_t}{p_t}$$

After calculation we will have the following results.

$$d_t = \frac{\theta}{1-\theta}w_t$$

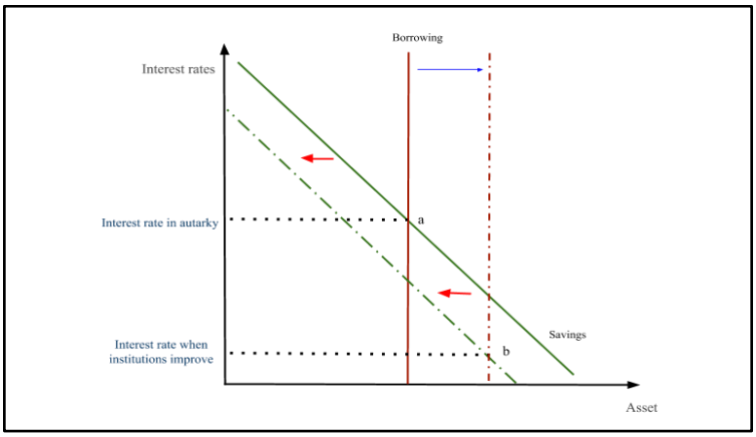
The borrowing in a case of underdeveloped country does not depend on the interest rate, so it is inelastic. The economic intuition is that the underdeveloped country does not have "good institutions" and therefore people do not trust them. Even though there are savings, this saving might not be lent out because of some associated risk (from insolvency, volatility of the market or lack of protection rights) or just there is nowhere to invest.

$$a_{t+1} = \frac{1}{1-\theta}\left[(1-\delta)\frac{p_{t+1}}{p_t} - \theta r_t\right]w_t$$

Savings are decreasing in interest rates; this result is important to understand the existence of a bubble. The interest rates falls when there is financial development because this means that agents can borrow more, the middle age people (the savers) could have access at bigger houses (larger borrowing when young) and there is an increase on wealth due to the increase on asset supply, but the first one dominates the second one so the overall demand of asset decreases. The intuition is that households would like to increase their savings but are limited by the borrowing constraint and therefore they spend the increase on wealth on consumption.

When the financially underdeveloped country integrates with the developed one, then the middle age agents are no longer constrained to invest, they can invest either in their home or abroad, so there is an existence of capital outflow. Graphically will be much easier to understand.

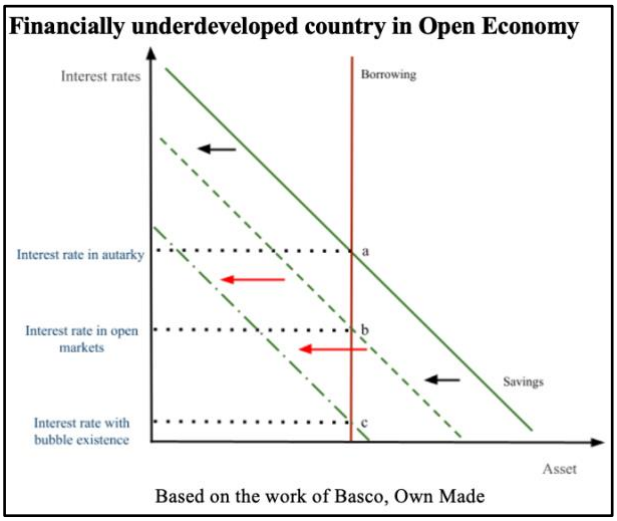
Financially underdeveloped countries in Autarky



Imagine that in time 0 there is an exogenous improvement of the financial system that allows an increase of borrowing, then this increase of borrowing will allow the middle age people at time 0 to lend more money (because they trust that they will have their savings returns), young at period 0 will borrow more in order to buy bigger houses (or any asset that can be collateralized). At period 1, the new middle age individuals will have their savings reduced relative to the last period group, this is because on average the loans were bigger and therefore the savings fell.

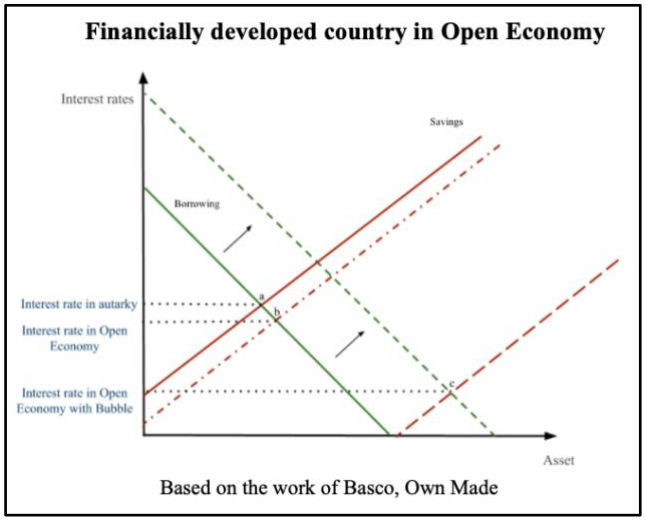
Now imagine that we are in an opened economy and therefore there is free flow of capital.

The story might be told as follows, initially the financially underdeveloped country has no access to the international market, let's say that the international monetary and financial system does not allow it. After an exogenous effect, the IMFS, allows countries to move capital across borders, then the middle-aged people will have the option to invest at home and abroad. Since there is a constraint in borrowing, then savings are not equal to borrowing (investments), thus there is a formation of "cash surplus" or as Bernanke called in 2005, the Global Saving Glut. Therefore, the middle-aged investors decide to invest abroad instead of the home country and therefore a decrease in the savings in the home country.



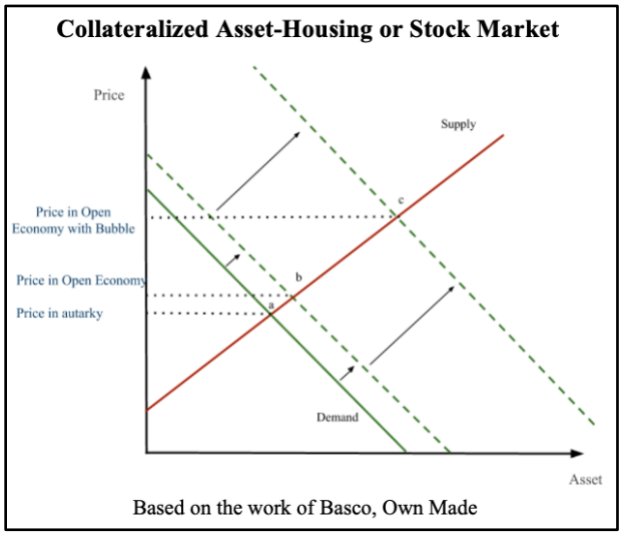
Now, imagine that there is an asset that promises very high return, since there is no capital control, the investors in a financially underdeveloped country (assuming that there are rational and the fees to invest abroad are not important) will invest more in the financially developed country (further decrease on demand). Consequently, in an open economy scenario interest tends to decrease, especially if there is an attractive asset that offers high return abroad.

The flow of capital will go towards the financially developed country, if there is no attractive asset to invest (no bubbles) the flow would be "moderate", interest rates would still fall. Now, imagine, that there is a scarce asset that can be collateralized with debt, usually housing and stocks, this will attract foreign capital and therefore it will "massively" expand the supply of savings[23], the consequence is falling interest rates that it will have consequences in the collateralized asset (Housing or stock).



[23] Although domestic savings would decrease because they will be able to borrow more but in aggregate terms (internal and external), it will increase.

As the interest rates fall, the demand of the collateralized asset increases. The intuition behind is as the interest rates decrease, the cost of borrowing decreases too and therefore the buyers will have incentive to take bigger loans (to buy bigger houses or to have higher leverage in the stock market). Consequently, the demand of the asset increases and by the law of demand-supply, prices increase. Hence the demand for borrowing also expands over time and the interest rate increases. The cycle ends with a contraction of the demand of the asset, people start to panic due to aversion of losses and the bubble disappears.



One observation of the Basco's OLG model is that tries to replicate the idea of the Global Saving Glut Hypothesis. The reasons are:

1. Exogenous events, out of the *financially develop countries hands*, will have an effect on them. Mainly through capital influx that will lower interest rates.
2. Even though in this paper did not discuss the implication on trade balance, the Basco's investigation extended the model to include the topic on trade and the conclusion of his extended model is the same as for the Global Saving Glut Hypothesis, that the receiver will have trade deficit and the creditor trade surplus.
3. Although it is not specifying what developed and not developed means in the Basco's OLG model, in this paper will interpreted as the ability to generate new asset according to the demand of it, in the financially underdeveloped country, the financial system is not able to generate assets and thus the constrain, meanwhile, in the financially developed country is able to generate such financial asset and thus fulfilling the demand and therefore no constraint in it.
4. Another implication of the model is with the Quantitative Theory of Money, originally this theory explains that if the monetary mass increases, then it will translate an increase on price if the other factors remain the same. However, we can extend this idea on the formation of bubbles and why if there is abundant capital, it will lead to bubbles. Let's take the equation $M \times V = P \times Y$, let's say that M represents the total amount of

savings (capital) and V represents the how many times your savings moves across the financial system (how many times you invest) then this should be equal on the amount of certain asset (Y=housing or stock market) times the price (P) of it. Let's begin with the example of the autarky in the financially underdeveloped country, this means that the elasticity to generate new asset is low and therefore Y is immobile therefore if there is capital accumulation due to economic growth then P must increase and therefore generating a possible bubble. In an open economy, capital will flow in the financially developed country but initially they will be able to balance it, however if more countries integrate in the world economy, the elasticity to create new assets diminishes and therefore a bubble might form.

5. Finally, this model can explain the excess financial elasticity (Borio,2019) that defines as the inability of domestic policy to prevent asset bubbles. The story this paper tries to build is as follows, financially underdeveloped countries accumulate assets, but they are unable to invest in their home country because of certain constraint (Basco,2014) then this will generate a situation in which the savings are far greater than investment, generating the Global Saving Glut (Bernanke,2005). Since the main reason that savings moves from financially constrained countries to financially unconstrained countries is due to the lack of good investment in the first one then the latter is unable to make policy to prevent the build-up because they are "inelastic" on interest rates and subsequently the formation of the bubble (Borio,2015). All this scenario is only possible if the IMFS allows capital mobility and therefore it can explain why in the Bretton Woods period there were no financial crisis in the developed countries (as shown also in the model that financially developed country in autarky is unable to create asset bubbles).

Obviously, this model fits the description of the Great Recession because the literature that this paper used to describe this model is specific to the Great Recession. However, this paper will make the bold hypothesis that this idea can also applied to the Great Depression.

First, we can see that the US in the 1920's was a period of high growth rates and therefore capital accumulation that translated to credit booms. As explained before, the US investor was initially not confident to European's countries ability to provide good investment and therefore they kept their money at home, however by mid-1920's the US ability to provide that good investment diminished because capital growth outgrew the investment growth and

therefore generating a Global (American)Saving Glut, adding the change of attitude of US investor due to an improvement of German economy, it attracted capital from the US to Europe, however in 1927/8, Germany was able to generate positive trade balance and thus eliminating the required capital and US investors turned to the stock market and broker lending signaling the start of the stock boom.

In the next section, this paper will prove the hypothesis; it will be clear that for the Great Recession will be much easier to prove it because the literature of the Basco's model was inspired by the Great Recession and the Dotcom Bubble. The challenge will be trying to prove the idea in the Great Depression. If proven correctly, we can infer that the IMFS type will have an impact on the formation of financial crisis and thus the best course of action is at least creating capital controls (This paper is not defending autarkic ideas but to defend some international coordination to avoid excess capital inflow towards a set of countries).

EMPIRICAL EVIDENCE OF THE OLG MODEL

To try to prove the point first, we must define what to prove, in this chapter we will try to show the following ideas from the previous section:

5.1. The idea of the Global Saving Glut for both period and the symptoms of it.
5.2. The idea that capital movement from financially underdeveloped countries is inelastic and independent from the financially developed country, the idea is that capital is expelled by the home country rather attracted by the foreign country.
5.3. The idea that foreign capital can create asset bubbles

The idea of the Global Saving Glut and the Symptoms empirical view

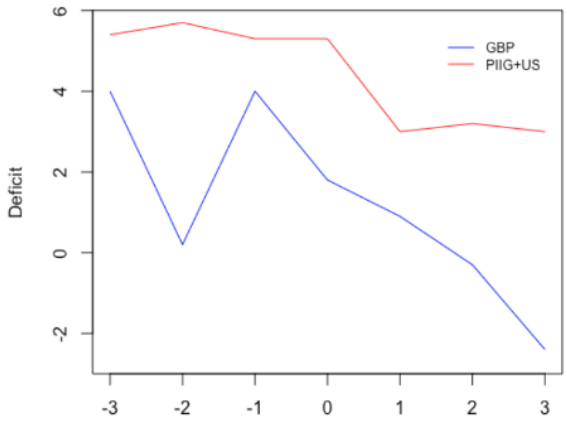
The similarities between both *Grand Financial Crises* are evident according to the empirical data, both experienced a prior asset boom that led to a collapse of the international lending and a banking crisis at the domestic level at certain countries. From 2001 through 2008, one half of Europe and the United States received enormous amounts of capital inflow from the other half of Europe and the rest of the world. From 1924 through 1928, one half of Europe received massive capital inflow from the other half and the rest of the world.

The tales of the Great Depression and the Great Recession can be summarized as follows, the lack of international cooperation and the free movement of capital (both depends on the international monetary and financial system IMFS) lead to increase current account imbalances between countries, those that have current account surpluses exported capital to the deficit countries, the desired savings of the countries with current account surpluses exceeds during a large period the investment desired, therefore in a free movement of capital environment the saving glut is transferred to the international lending market. Consequently, interest rates fall, and it will create a higher demand on assets that can be collateralized (eg. House, stock).

In the 1920's, numerous countries in central and easter Europe and among non-European primary producers a persistent imbalance on the current account existed. The United States at the time was by far the most important surplus nation, both in trade and current account The deficit was sustained by the influx of international investment, above all the United States and to a limited extent the UK, France, and others.

In contrast to the 2000's, the United States was by far the country with the largest current account deficit in gross term, moreover, some Southern Europeans countries had significant current account deficits in relative terms. At the time China, Central Europeans Countries and significant part of the non-European primary producers sustained the current account deficit of the first group.

Figure 13: Current Account Across the Great Crises



Current Account Across the Great Crises. Data Font:http://www.macrohistory.net/data/ Source:Own made.

Blue:Germany,Belgium and Portugal. (Great Depression)

Red: Portugal,Italy,Ireland,Greece,Spain and US.(Great Recession)

This graph is centered at the year that the crisis began; so, for the red line it would be 2008 and the red line 1929

If the hypothesis of the GSG and the Basco's model be true, we will observe that interest rates must fall during the formation of the bubble. Prior to the bubble burst, we must observe that interest rates should increase and therefore the bubbles disappear. For that we will use the data of the US-Germany from 1924 to 1935, US-Germany from 1998-2010.

Figure 14: Interest rates comparison

Interest rates comparison. Data Font:http://www.macrohistory.net/data/ Source:Own made.

Red:Germany Blue:United States

As we can see, the data looks to support the idea of Basco, interest rates at the beginning of the bubbles decrease in both countries (US and Germany) but the later year interest rates rose in both cases.

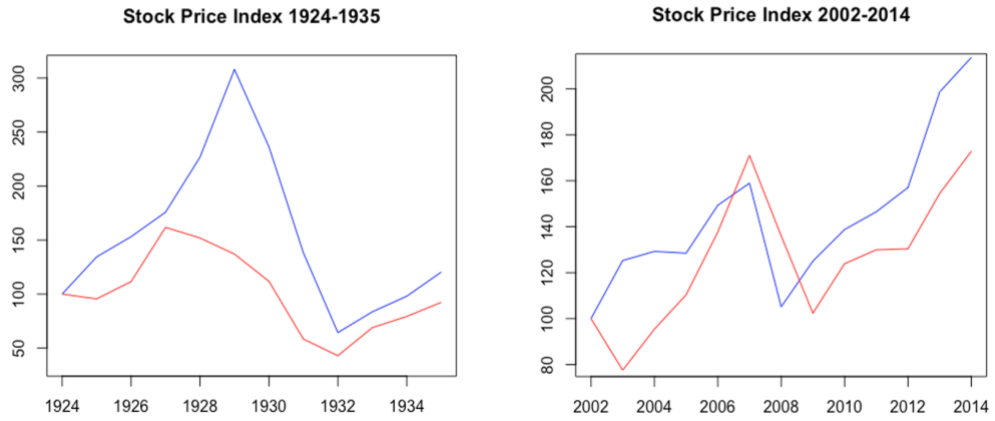
¶ The interest rate in the early 1920 in the US, was 7.74%, by 1926 was 4.06%, since 1926 it started to increase when it peaked in 1929 with 7.61%. The Florida Housing Bubble started in 1920 and it burst in 1926, later the Stock market rally started in 1927 and burst in 1929 (see figure 15). Approximately following the pattern predicted by Basco's work. In Germany from 1924 to 1929 experienced a price boom on the housing market almost doubling the price (see figure 16). By 1924, the interest rate was 11.11%, in 1926 it bottomed at 6.03% but from 1927 to 1929, interest rates increased and peaked in 1929 with 8.27%.

¶ The same story can be told in the housing bubble, in the early 2000 interest rate in the US and Germany started to decrease, however by 2005 the interest rates of both countries started to increase. In 2007, the subprime crisis started in the US just when

interest rates peaked. In Germany and Europe, it peaked in 2008, when the housing bubbles in some European countries peaked. (see figure 16)

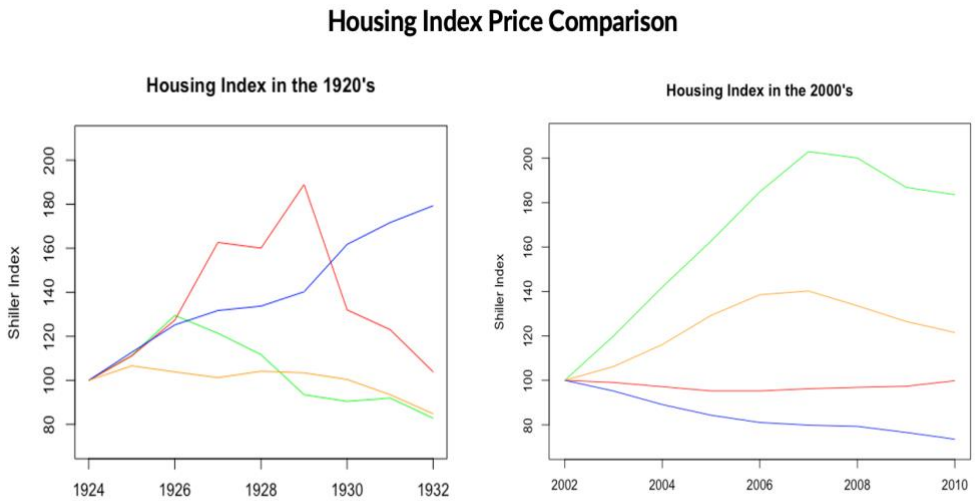
One interesting pattern we can observe is that the surplus countries tend not to have housing bubbles, in the deficit countries do. (See figure 16), however the same relationship cannot apply to the stock market.

Figure 15: Comparison of the stock market 1920ôs v



Red:Germany Blue:United States

Figure 16: Comparison of the housing market 1920ôs



Housing Index in the 1920's; red-Germany, blue-France, Green-UK, Yellow-USA
Housing Index in the 2000's; red-Germany, blue-Japan, Green-Spain, Yellow-USA

The idea that capital is expelled by the financial underdeveloped country rather attracted by the financially developed countries

The are many literatures that tries to explain the factors of attraction of foreign capital, the most prominent one is the *Push-Pull* Analysis. The push pull analysis tries to measure which factor is the most important when capital move across borders. The Push factor is defined as "variables" that encourages to move capital to another countries. This factor is more related to the conditions of the country of origin (the lender). Meanwhile, the Pull factor is defined as conditions from the borrowing countries that attracts capital.

The idea is that to confirm the paper's hypothesis, the Push factor should be more "significant" than the Pull factor. The reason is that the Basco's model assumes that there are countries that are financially underdeveloped and thus cannot provide meaningful investment to the savers, so the capital owners are "forced" to search opportunities in the international market. The constraint faced by the capital holders in the model is not defined but we can interpret as the Push factor, savers are not able to invest at home, so they are "pushed" away from the home country.

The reality is that many studies prove that the "push" factor is the dominant factor in the roaring 20's and the Great Moderation (the periods prior the Grand Crises). Thus, proving this paper idea. Eichengreen and Accomiotti (2013) proved in the "*The Mother of all sudden stops: Capital flow reversal in Europe,1919-1932*" that the pull factor cannot account for the surge and sudden stop in capital flow, but the push factor was significant drivers of capital in the 1920's

Eichengreen and Accomiotti (2013) did the following regression lines to explain the main drivers of capital.

For the "Pull" factor, they had the dependent variable the (log of the) total amount borrowed by a given country each year. The explanatory variables are the economic size (Real GDP), economic development (lagged GDP per capita), economic performance (lagged Real GDP growth), inflation rate (lagged), public debt to fiscal revenue, government budget balance to revenue, international reserves to imports, dummy Gold Standard, Primary exporter (Dummy variable) , dummy League of Nation (if the country has the assist of the League of

Nation to get foreign capital, as noted by Ritschl (2002), countries like Germany enjoyed "transfer protection mechanism[24]" that incentivized investments) and finally since Germany was the main borrower to the period, two dummies variables are also included the model, the first dummy is to try to capture the effect of the Dawes Plan in Germany (1924-1928) and the second is to capture the effect of Young Plan in Germany (1929-1932).

Model 2: Pull Factor OLS (1924-1934)

Accominotti & Eichengreen Regression Model: Pull Factor OLS

	1924-1932	1924-1928	1929-1932
Constant	-16.168**	-18.089*	-13.290
	(-2.54)	(-1.81)	(-1.57)
Ln Real GDP	1.169***	2.294***	0.682
	(2.82)	(3.42)	(1.20)
Lagged Ln Real GDP per capita	0.636	-0.126	0.912
	(1.06)	(-0.13)	(1.18)
Lgged GDP Growth	0.004	-0.056	0.039
	(0.09)	(-0.83)	(0.62)
Lagged Inflation	0.006	-0.021	-0.017
	(0.21)	(-0.58)	(-0.24)
Lagged Public Debt/Revenues	-0.057	-0.013	-0.283
	(-0.54)	(0.10)	(-1.35)
Lagged Budget Balance/Revenues	-0.514	-0.298	-0.667
	(-0.41)	(-0.15)	(-0.41)
Lagged Reserves/Imports	-1.344	-6.473***	0.772
	(-1.67)	(-3.84)	(0.63)
Gold Standard	0.568	0.536	0.396
	(0.92)	(0.56)	(0.44)
Primary Exporter	1.269*	3.011***	0.669
	(1.85)	(2.66)	(0.74)
Germany 1924/28	1.504	-0.040	
	(0.97)	(-0.02)	
Germany 1929/32	0.426		1.021
	(0.28)		(0.59)
League of Nations	0.534	1.488	0.126
	(0.90)	(1.41)	(0.16)
N	139	65	74
Adjusted R2	0.22	0.23	0.16

The first observation of the result is that the goodness of fit (R2) of the OLS is quite low, which usually indicates that the model does not explain much of the dependent variable.

The second observation is that for the period of 1924-28, the size of the economy, the reserves and being exporter of primary goods is significant however the second period 1929-

[24] Transfer protection mechanism gave commercial credits first claim rights to the foreign capital available in the invested country.

1932 none of the variables is significant. Furthermore, there are variables that looks like that they have different sign for instance countries that were more developed in terms of GDP per capital in the first period apparently tended to have less gross capital inflow than countries that were less developed (it also happens with grow rates). The most significant changes are with the Reserve, countries that tend to have large reserves of foreign currencies or gold tend to have less gross capital flow than countries that had less in the first period, but in the second the reverse occurs. The most obvious answer of this is an historical one, with the 1929 crack and the panic that ensued investors decapitalized investments from foreign countries to take their savings/capitals back and thus expanding the crisis, but another reading of the results can be made, the interpretation is focused in the first period, the idea goes as follow, countries with larger capital accumulation exported capital abroad because there were no "good-enough" investment on their home country and thus exporting more capital towards countries with much smaller reserves. If this interpretation is correct, then the idea of the Global Saving Glut and the Basco's model will be useful to explain, not only the Great Depression but every financial depression that the international capital had a role.

For the pull factor regression, the focus of the dependent variable is how much money did the financial capital exported to the receptors, for that, a proxy variable was chosen, (the log of) the total volume of total bonds of a given financial center each year. The first variable is the perception of risk, so the long interest rate was chosen as a proxy variable, then volatility of the stock as a measure of the perception of risk of the equity market, Real GDP (log terms) and finally 2 control variables for the European level, which is GDP growth and Trade Openness.

Four different regression lines are created, the first one is a simple Pool OLS, the second one is a Pool OLS with time dummies, the third is a Fixed Effect Model and finally, the fourth is a Fixed Effect Model with time dummies.

Model 3: Push Factor OLS (1924-1932)

Accominotti & Eichengreen Regression Model: Push Factor OLS				
	Pooled OLS	Pooled OLS	Fixed Effect	Fixed Effect
Constant	9.587***	11.692***	-10.409	-53.948
	(2.89)	(3.73)	(-0.36)	(-1.16)
Ln Real GDP	0.239*	0.256*	2.103	6.13
	(1.69)	(1.74)	(0.80)	(-1.48)
Volatility of Stock Return	-0.106***	-0.118***	-0.117***	-0.119***
	(-4.79)	(-4.37)	(-4.54)	(-3.43)
Long Term Interest Rates	-1.891***	-1.831***	-1.794***	-1.796
	(-6.64)	(-5.20)	(-4.48)	(-3.89)
European Real GDP Growth	-0.006		0.009	
	(-0.12)		(0.16)	
European Trade Openess	0.369*		0.174	
	(1.69)		(0.55)	
Year dummies	No	Yes	No	Yes
Financial Center Fixed Effect	No	No	Yes	Yes
N	72	72	72	72
Adjusted R2	0.64	0.64	0.62	0.69

As we can see, the model of pull factor from Accominotti and Eichengreen, very few variables are significant with the traditional level of confidence (1%,5% and 10%), furthermore the adjusted goodness of fit is quite low, between 0.23 (at best) and 0.16 (at best). In contrast the push factor seems more explanatory, we have that the volatility and the long-term interest rates (proxy variable of the investor's expectation) are significant with all the confidence levels. The adjusted goodness of fit is quite high between 0.62 to 0.69 and thus indicating that the Push factor was more significant than the pull factor.

The conclusion we can get is that during the roaring 1920's the factor of attraction of capital was mainly due to the expulsion of capital from countries with trade surplus. This result shows that the Basco's model is correct because countries with trade surplus, and thus capital surplus, is unable to transform all the savings into domestic investment, there are significant chunk of capital that is "expulsed" from the system to invest to other countries with more investment opportunities.

For the period of the Great Moderation (2000-2009), this paper tried to recreate the regression lines of the Accominotti & Eichengreen (2013) work.

For the pull factor model, this paper uses portfolio inflow variable[25] as the dependent variable (it will be a proxy of the bond issuing of the original work), we exclude the variables Gold Standard, Germany, Primary Exporter and League of Nations because we consider that this paper will be "useless". The reason is simple, the Gold Standard did not exist anymore, Germany was no longer a borrower, all the countries are developed countries and the share of raw materials is relatively small in all the countries and finally these countries did not receive assistance from the League of Nations (United Nations in this case).

We also lagged (First degree) all the explanatory variables, except Ln Real GDP. So, the model is as follows:

Model 5: Pull Factor OLS (2000-2010)

Accominotti & Eichengreen Regression Model: Pull Factor OLS

	2000-2010	2000-2005	2006-2010
Constant	-15.392**	8.08	-23.706**
	(5.79)	(5.86)	(10.12)
Ln Real GDP	0.078*	0.11***	0.07
	(0.04)	(0.03)	(0.07)
Lagged Ln Real GDP per capita	1.229**	-1.06*	1.87*
	(0.55)	(0.59)	(0.90)
Lgged GDP Growth	0.02	0.07*	0.06
	(0.03)	(0.03)	(0.04)
Lagged Inflation	-0.01	0.07	-0.06
	(0.04)	(0.05)	(0.05)
Lagged Public Debt/Revenues	0.002*	-0.001	0.007**
	(0.001)	(0.0008)	(0.003)
Lagged Budget Balance/Revenues	0.005	-0.01**	0.03
	(0.006)	(0.004)	(0.02)
Lagged Reserves/Imports	0.001	0-001	-0.0004
	(0.002)	(0.02)	0.003
N	59	23	24
Adjusted R2	0.37	0.59	0.56

The results of the regression line show that for the overall period, the proportion of the variance in the dependent variables that is predicted from the independent variables is quite low, around 0.37. Not many variables are significant in all confidence levels. However, if we divide the periods, it seems that it performs much better but further studies is needed to determine if the model is truly unbiased and efficient.

[25] The variables are from the World Bank data base and it describes all the equity and financial asset purchased by foreigners.

For the Push regression model, this paper also tries to recreate the model of Accominotti & Eichengreen (2013). This paper will use as the dependent variables the Financial Account[26] of each country each year. We exclude the control variables of Europe Growth and Europe Trade Openness. Most of the countries in the data set are considered as "developing countries" because they were the main capital exporter (and thus a positive Financial Account that indicates the flow of purchasing foreign investments).

Model 4: Push Factor OLS (2000-2010)

Accominotti & Eichengreen Regression Model: Push Factor OLS				
	Pooled OLS	Pooled OLS	Fixed Effect	Fixed Effect
Constant	-98.030***	-109.96***	-660.79***	-417.42
	(12.63)	(12.71)	(109.81)	(156.41)
Ln Real GDP	3.916***	4.23	24.16	15.15
	(0.50)	(0.46)	(3.98)	(5.71)
Volatility of Stock Return	-0.109	-0.15**	-0.04	0.02
	(0.06)	(0.06)	(0.06)	(0.08)
Long Term Interest Rates	-0.02	0.13	0.71*	0.71*
	(0.19)	(0.19)	(0.35)	(0.42)
Year dummies	No	Yes	No	Yes
Financial Center Fixed Effect	No	No	Yes	Yes
N	103	103	103	103
Adjusted R2	0.40	0.51	0.63	0.69

The models of the Push Factors seem to perform slightly better, the simple Pooled OLS is slightly better than the Pull Factor model, at 0.40 but if we include the more complex models like the Fixed Effect model with time dummies the R2 jumps to 0.69. This indicates that the Push model performs slightly better (at worst) or much better (at best). For the explanatory variables, the role of it seems quite ambiguous and more investigation is needed to perfect the models (This paper tried to recreate the Push-Pull models of Accominotti & Eichengreen, 2013).

Still many literatures regarding the Push-Pull factor indicates that in the Great Moderation, the main factor was the Push, as shown in this paper.

Fratzscher (2012) conclude in his findings that Push factors such as liquidity risk have indeed exerted a significant effect on capital flow to EME's and some advanced countries and

[26] The Financial Account indicates the investment made by a country (it includes FDI, Portfolio

with the Great Recession the push effect has continued to exert sizable effect on global capital flow, however, the Pull effect had also important effects on the global capital flow, specially related to institution quality and fundamentals macroeconomic policies. This will support the idea of the Basco's model in which financially underdeveloped countries "push" their savings and they are attracted ("pull") by the financially developed countries.

Gosh et al (2014) found that EMEs the magnitude of capital flow surges is highly correlated with domestic factors (financial external needs, exchange rates and capital account openness).

Finally, Kang & Kim (2019) also shows that push and pull factors is statistically determinant for AEs meanwhile pull factor is more determinant in EMEs.

The findings of the Accominotti & Eichengreen (2013) and the many literature stated in this part supports the idea of the Basco's model, also the Global Savings Glut hypothesis of Bernanke. This paper also finds that the factors of capital flow is similar across the roaring 1920's and the great Moderation of the 2000's. This can be indicator that the surges of capital and subsequential burst is significant to financial crises.

The idea that foreign capital can create asset bubbles

The main idea behind the creation of economic bubbles is a weak financial policy and excessive monetary liquidity in the financial system (Topol,1991). Girdzijauskas et al (2010) identifies 3 types of economic bubbles: stock market bubbles, real states bubbles and other markets bubbles (this includes commodities. i.e., The tulip bulb mania). While the causes of the formation of bubble is currently highly debated, the Logistic growth models (according to the interpretation of Girdzijauskas et al (2010)) have some features for predicting economic bubbles. So, the features are:

- High and increasing growth rates in economy
- The low interest rates and easiness of the credit
- Foreign credit can help to form bubbles
- Complete usage of factors (lack of innovation and stagnation in financial expansion)
- Phycological pressure on demand and limited supply

So, a model is needed to confirm the idea of the Logistic Growth model (interpretation by Girdzijauskas).

This main problem of this model is related to the price approach as noted by Taylor (1996), the problem is that we need to use identical assets and prices and usually the data is not available for all the countries. Thus, we will use only data from the United States because it is easier. The simple OLS model we proposed is as follows:

For the Great Depression, a stock bubble approach is needed.

$$\text{Stock Price} = \alpha + \beta_1 \text{EG} + \beta_2 \text{IR} + \beta_3 \text{CA} + \beta_4 \text{CPI} + u_i$$

For the Great Recession, a real state bubble approach is needed.

$$\text{House Index} = \alpha + \beta_1 \text{EG} + \beta_2 \text{IR} + \beta_3 (-\text{FA}) + \beta_4 \text{CPI} + u_i$$

EG	represents Economic Growth.
IR	represents Long Interest Rates.
CA/(-FA)	represents the financial account (It is negative because a negative FA represents that foreign holders increased their position; this is a proxy variable for foreign capital). For the period of the 1920's, this paper will use CA as a proxy variable since financial account is not available
CPI	represents inflation. Some literatures point out that inflation can create bubbles.

The model that this paper will use is a simple OLS model inspired by the APT asset pricing model (Ross,1976), the theory states that the asset pricing can be modeled as a linear function of various macroeconomic and statistical variables and thus each beta represents the sensitivity of such asset (how variable x will impact on the asset pricing).

The data we use for the stock model is from 1922-1933 and it only takes the US stock market. For the second model, we take the data from 1999-2010 and it also takes values from the US housing market.

The first results are from the stock bubble of the roaring 20's, as we can see the model shows that (long) interest rates, foreign capital is significant in all traditional level. Interest rates shows a negative relationship between stock prices and in an economic intuition makes sense, the higher interest rates are the lower is the price of the stock because investors have the incentive to keep capital in deposits rather to risk in the equity market. In contrast inflation rates is weakly significant (at 10%) and it looks like that it has a negative effect, contradicting many literatures that defends inflation as a cause of bubbles. Economic growth has a positive effect on the stock prices nevertheless it is not statistically significant. The fitted value of the model is 0.79, quite high value, however, many variables still miss like the "ought to be proxy variable for psychological pressure" stated in (Stasys Girdzijauskas, 2010; Topol, 1991) paper.

Model 5: OLS Stock Price (1920ôs)

OLS of Stock Price			
	Coefficient	Std. Error	P-Value
Const	8.173***	0.905	0.0001
Long Term Interest Rates	-1.081***	0.248	0.0049
Economic Growth	0.024	0.016	0.1908
Foreign Capital (CA)	1.067***	0.228	0.0034
Inflation (CPI)	-0.035*	0.017	0.0901
R2	0.79		
R2 adjusted	0.65		
Dependent Variable	Log of Stock Price		

The second results from the housing bubble of the 2000's shows that foreign capital had a positive role on the overall house index price, so foreign capital "helped" increase prices and it is relatively significant at 5% and 10% confidence level. Meanwhile, interest rates show a negative relationship, but it is not statistically significant (maybe the easiness to access credit made consumer's demand for loans to buy houses inelastic. i.e., Sub-prime mortgages). Economic growth shows a positive relationship but is not statistically significant as for the

inflation rate with a negative relationship. The fitted value of this regression is 0.82, slightly higher than the previous model.

Model 6: OLS House Price (2000ô s)

OLS of Housing Price			
	Coefficient	Std. Error	P-Value
Const	5.239***	0.246	1.28e-07
Long Term Interest Rates	-0.075	0.050	0.432
Economic Growth	-0.014	0.017	0.182
Foreign Capital (CA)	0.085**	0.028	0.021
Inflation (CPI)	-0.050	0.053	0.381
R2	0.82		
R2 adjusted	0.73		
Dependent Variable	Log of Housing Index		

As for the conclusion, we can see that the only variable that is somewhat significant across both models is the foreign capital, thus indicating that foreign capital plays an important role in the pricing of asset and maybe exuberating the bubble. This proved the view of Borio (2014) that the current system exploits domestic weaknesses by creating credits booms and asset bubbles, we can also extrapolate for the 1920's because fixed exchange rate promotes capital flow by eliminating foreign exchange risks and obviously the period was a period of free movement of capital.

CONCLUSIONS

The conclusion of this paper is capital inflow DOES affect the formation of financial bubbles. As shown in the OLS about asset pricings, foreign capital DOES effect on asset pricing. Furthermore, we have proven that capital mobility varies across time (Taylor,1996) and the IMFS influences such mobility, as shown in the description of each historic IMFS and the averages regressions line of F-H.

The financial crises seem to correlate with the IMFS as shown in the graph (The frequency of financial crises), we can see that the Gold Standard Period and the Current one has various episodes of financial crises. This can be related with the idea of Borio (2014) that describes that the current IMFS, and hence other systems, can exploit domestic weaknesses in form of asset bubbles (the idea of excess financial elasticity). The idea of Borio can also be related with the idea of the Global Saving Glut (Bernanke, 2005) and this is because as shown in the Basco's model, international flow can generate asset bubbles in countries that are financially developed with international capital flow. Therefore, the story could be told as follows, some countries will have surpluses of capital (Global Saving Glut). If the IMFS systems enable that capital to move across borders, then it can create an excess financial elasticity that otherwise it would not experience. If the capital remains in the country, then it will generate financial bubbles, if the capita goes to another country, then it may create bubbles in the foreign country or at least help to inflate the asset price.

Finally, this paper will make a grim prediction that unless there is a real international cooperation between countries, more asset bubbles will exist and the prevention of such bubble must be first in the international level to avoid imbalanced between countries and also internal mechanism to avoid "unnecessary" accumulation of capital, one example of such mechanism is the tax system ,Kumar (2011) showed that the tax mechanism (not only the marginal tax rate but also deductibles) if design with loopholes that benefit capital owners (rich guys) will have a pro-cyclical effect on asset pricing and thus asset bubbles.

If Capital were a persona and this is a trial, then the veridic would be "GUILTY" but only because the system encourages to behave in a "guilty way". The Golden Age of Capitalism has shown that a stable financial market is possible, but it requires cooperation to subdue the market forces that exploits domestic weaknesses and create incentive for not do it.

APPENDIX 1: MODELS

Model 1. This model includes all the F-H regression results. The tittles are:

I. The results of the FH tests in the long run and the short run
II. Panic of 1893, The Great Depression 1929, The Dotcom 2001 & The Great Recession 2008
III. The Gold Standard (1870-1914,1925-1936)
IV. The Gold Standard (1870-1914)
V. The Gold Standard (1925-1936)
VI. Bretton Woods (1955-1971)
VII. The current IMFS System (1980-Now)

All the data font is from MACROFINANCE & MACROHISTORY LAB (Universität Bonn): Òscar Jordà, Moritz Schularick, and Alan M. Taylor. 2017. "Macrofinancial History and the New Business Cycle Facts." in *NBER Macroeconomics Annual 2016*, volume 31, edited by Martin Eichenbaum and Jonathan A. Parker. Chicago: University of Chicago Press.

The dependent variable of the models is the ratio of (Investment/GDP). The explanatory variable of the models is the ratio of (Savings/GDP), to get the national savings a simple computation from the data set was needed. The calculation is simple S=CA+I.

The data sample includes the following countries: Australia, Belgium, Canada, Switzerland, Germany, Denmark, Spain, Finland, France, United Kingdom, Ireland, Italy, Japan, Neatherlands, Norway, Portugal, Sweden, United Stated. The years are from 1860-2017.

SUMMARY STATISTICS

	Mean	Median	S.D	Min	Max
(Investment/GDP)	0.188	0.1931	0.06403	0.01729	0.3889
(Current Account/GDP)	(0.005)	-0.0009824	0.04339	-0.2193	0.1897
(Savings/GDP)	0.167	0.178	0.09252	-0.2193	0.4169

Models 2 & 3: These models correspond to the Push-Pull Analysis from the roaring 2 0 ô s .

I. Pull Factor OLS (1924-1932): Accominotti & Eichengreen Regression model: Pull Factor
II. Push Factor OLS (1924-1932): Accominotti & Eichengreen Regression model: Push Factor

These models are from Accominotti & Eichengreen (2013): "*The mother of all sudden stops: Capital Flow and reverslas in Europe,1919-1932*".

Accominotti, O. a. (2013). *The Mother of All Sudden Stops: Capital Flows and Reversals in Europe, 1919-1932.* Berkeley: University of California, Berkeley.

The data includes the following countries: Austria, Belgium, Bulgaria, Czechoslovakia, Danzig, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxemburg, Netherlands, Norway, Poland, Portugal, Rumania, Spain, Sweden, Switzerland, United Kingdom, United States, Yugoslavia. The years are from 1924 to 1932.

SUMMARY STATISTICS

	Num. Of Countries	Years	Unit	Mean	S.D	Min	Max
Gross Bond Issues (receiving country)	26	1919-1932	Mio 1990 USD	113.39	341.02	0	36550.8
Gross Bond Issues (By fianancial center)	6	1919-1932	Mio 1990 USD	533.81	868.43	0	3981.57
Real GDP	20	1924-1932	Mio 1990 USD	47659	61150.32	4976	263367
Real GDP per capita (lagged)	20	1924-1932	Ratio	3125.2	1373.39	908.69	6331.68
Real GDP growth (lagged)	20	1924-1932	%	2.83	5.49	-18.53	25.76
Inflation (lagged)	20	1924-1932	%	3.34	20.48	-35.86	196.48
Public debt/fiscal revenues (lagged)	20	1924-1932	Ratio	3.94	2.82	0.65	15.62
Public budget balance/fiscal revenues (lagged)	20	1924-1932	Ratio	-0.1	0.2	-0.97	0.23
International reserves/Imports (lagged)	20	1924-1932	Ratio	0.38	0.31	0.07	2.14
Gold Standard	20	1924-1932	Dummy	0.61	0.49	0	1
Primary exporter dummy	20	1924-1932	Dummy	0.55	0.5	0	1
Real GDP (financial centers)	6	1921-1932	Mio 1990 USD	199329.7	249341	15854	84334
Stock Market Volatility	6	1921-1932	%,annualized	14.95	10.13	2.44	46.49
Long-Term interest rates	6	1921-1932	%	4.6	0.75	3.29	6.48
European GDP growth	-	1921-1932	%	2.33	4.4	-4.89	8.6
European trade openesses	-	1921-1932	%	7.92	1.02	5.58	9.04

The financial center are France, Netherland, Sweden, Switzerland, United Kingdom and United States.

Models 4 & 5: These models correspond to the Push-Pull Analysis from the Great Moderation (2000-2010).

I. Pull Factor OLS (2000-2010): Accominotti & Eichengreen Regression model: Pull Factor
II. Push Factor OLS (2000-2010): Accominotti & Eichengreen Regression model: Push Factor

This is a recreation of the model of Accominotti & Eichengreen.

All the variables, except stock volatility, come from the World Bank Database. The stock volatility comes from the Federal Reserve of Sant Louis Data base.

The countries include Australia, Czech Republic, Greece, Iceland, Ireland, Italy, Lithuania, New Zeeland, Portugal, Poland, Spain, United States, United Kingdom, Russia Federation, China, Japan, Germany, Arabia Saudi, Thailand, Norway, Switzerland, Korea Rep., and Bahrein.

SUMMARY STATISTICS

	Num. Of Countries	Years	Unit	Mean	S.D	Min	Max
Gross Bond Issues (receiving country)	12	2000-2010	Mio 2010 USD	2085	503.4	-4817	275600
Gross Bond Issues (By fianancial center)	10	2000-2010	Mio 2010 USD	6257	5032	936	244300
Real GDP	12	2000-2010	Bio 2010 USD	172	302	105	15000
Real GDP per capita (lagged)	12	2000-2010	Ratio	31896	13413	6934	54708
Real GDP growth (lagged)	12	2000-2010	%	2.61	2.98	3.42	-14.84
Inflation (lagged)	12	2000-2010	%	2.62	3.42	-14.85	11.11
Public debt/fiscal revenues (lagged)	12	2000-2010	Ratio	242.8	198.4	75.85	994.3
Public budget balance/fiscal revenues (lagged)	12	2000-2010	Ratio	2.12	28.81	75.84	44.33
International reserves/Imports (lagged)	12	2000-2010	Ratio	-2.34	28.81	-112.4	44.33
Real GDP (financial centers)	10	2000-2010	Bio 2010 USD	160	807	15.6	6087
Stock Market Volatility	10	2000-2010	%,annualized	26.91	11.27	9.37	67.97
Long-Term interest rates	10	2000-2010	%	5.62	3.74	9.3	24.3

The financial centers are Russia Federation, China, Japan, Germany, Arabia Saudi, Thailand, Norway, Switzerland, Korea Rep., and Bahrein.

Model 5 & 6: OLS to determine asset prices (Stock and Housing).

I. OLS Stock Price (1920's)
II. OLS House Price (2000's)

All the data is from the United States. The OLS stock price goes from 1922-1933 and the OLS house price is from 1999-2010.

I. OLS Stock Price (1920's)

Long Term Interest rates	MACROFINANCE & MACROHISTORY LAB
Economic Growth	MACROFINANCE & MACROHISTORY LAB
Foreign Capital (CA)	MACROFINANCE & MACROHISTORY LAB
Inflation Rate (CPI)	MACROFINANCE & MACROHISTORY LAB
Stock Pricing	FEDERAL RESERVES OF ST. LOUIS

SUMMARY STATISTICS

	Mean	Median	S.D	Min	Max
Long Interest Rates	3.63	3.57	0.35	3.31	4.35
Economic Growth	-0.47	0.80	7.43	-13.76	11.27
Current Account	0.59	0.65	0.43	-0.25	0.96
Stock Price	156.60	137.90	74.06	64.23	307.60
CPI	-2.32	-1.69	2.34	-9.86	2.33

II. OLS House Price (2000's)

Long Term Interest rates	MACROFINANCE & MACROHISTORY LAB
Economic Growth	MACROFINANCE & MACROHISTORY LAB
Foreign Capital (FA)	WORD BANK DATABASE
Inflation Rate (CPI)	MACROFINANCE & MACROHISTORY LAB
Housing Index	MACROFINANCE & MACROHISTORY LAB

Most of the data font is from MACROFINANCE & MACROHISTORY LAB (Universität Bonn): Òscar Jordà, Moritz Schularick, and Alan M. Taylor. 2017. "Macrofinancial History and the New Business Cycle Facts." in *NBER Macroeconomics Annual 2016*, volume 31, edited by Martin Eichenbaum and Jonathan A. Parker. Chicago: University of Chicago Press.

SUMMARY STATISTICS

	Mean	Median	S.D	Min	Max
Long Interest Rates	4.45	4.45	0.86	3.21	6.03
Economic Growth	1.07	1.66	2.14	-4.32	3.63
Financial Account	5.25	5.22	1.85	2.38	8.25
Housing Index	186.30	193.10	32-79	133-6	227.80
CPI	2.46	2.76	1.13	-0.35	3.84

APPENDIX 2: GRAPHICAL FIGURES

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